

23°, 337° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	Dec.
0	6	26.5	+59.9	156.8	5	31.3	+59.9	156.9	4	36.1	+60.0	156.9	3	40.9	+60.0	156.9	2	45.7	+60.0	157.0	1	50.5	+60.0	157.0	0
1	7	26.4	+59.9	156.8	6	31.2	+60.0	156.8	5	36.1	+59.9	156.9	4	40.9	+59.9	156.9	3	45.7	+60.0	157.0	2	50.5	+59.9	157.0	1
2	8	26.3	+60.0	156.7	7	31.2	+59.9	156.8	6	36.0	+60.0	156.9	5	40.8	+60.0	156.9	4	45.7	+59.9	156.9	3	50.4	+60.0	157.0	2
3	9	26.3	+59.9	156.7	8	31.1	+60.0	156.8	7	36.0	+60.0	156.8	6	40.8	+60.0	156.9	5	45.6	+60.0	156.9	4	50.4	+60.0	156.9	3
4	10	26.2	+59.9	156.7	9	31.1	+59.9	156.7	8	36.0	+59.9	156.8	7	40.8	+60.0	156.8	6	45.6	+60.0	156.9	5	50.4	+60.0	157.0	4
5	11	26.1	+59.9	156.6	10	31.0	+60.0	156.7	9	35.9	+60.0	156.7	8	40.8	+60.0	156.8	7	45.6	+60.0	156.9	6	50.4	+60.0	156.9	5
6	12	26.0	+60.0	156.6	11	31.0	+59.9	156.6	10	35.9	+59.9	156.7	9	40.8	+59.9	156.8	8	45.6	+60.0	156.8	7	50.4	+60.0	157.0	6
7	13	26.0	+59.9	156.5	12	30.9	+60.0	156.6	11	35.8	+60.0	156.7	10	40.7	+60.0	156.8	9	45.6	+60.0	156.9	8	50.4	+60.0	156.9	7
8	14	25.9	+59.9	156.5	13	30.9	+59.9	156.6	12	35.8	+60.0	156.6	11	40.7	+60.0	156.7	10	45.6	+60.0	156.8	9	50.4	+60.0	156.9	8
9	15	25.8	+60.0	156.4	14	30.8	+60.0	156.5	13	35.8	+59.9	156.6	12	40.7	+60.0	156.7	11	45.6	+60.0	156.8	10	50.4	+60.0	157.0	9
10	16	25.8	+59.9	156.3	15	30.8	+59.9	156.5	14	35.7	+60.0	156.6	13	40.7	+59.9	156.7	12	45.6	+59.9	156.8	11	50.4	+60.0	156.8	10
11	17	25.7	+59.9	156.3	16	30.7	+60.0	156.4	15	35.7	+60.0	156.5	14	40.6	+60.0	156.6	13	45.5	+60.0	156.7	12	50.4	+60.0	156.8	11
12	18	25.6	+59.9	156.2	17	30.7	+59.9	156.4	16	35.7	+59.9	156.5	15	40.6	+60.0	156.6	14	45.5	+60.0	156.7	13	50.4	+60.0	156.8	12
13	19	25.5	+60.0	156.2	18	30.6	+59.9	156.3	17	35.6	+60.0	156.5	16	40.6	+60.0	156.6	15	45.5	+60.0	156.7	14	50.4	+60.0	156.8	13
14	20	25.5	+59.9	156.1	19	30.5	+60.0	156.3	18	35.6	+59.9	156.4	17	40.6	+59.9	156.6	16	45.5	+60.0	156.7	15	50.4	+60.0	156.9	14
15	21	25.4	+59.9	156.1	20	30.5	+60.0	156.4	19	35.5	+60.0	156.5	18	40.5	+60.0	156.5	17	45.5	+60.0	156.7	16	50.4	+60.0	156.9	15
16	22	25.3	+59.9	156.0	21	30.4	+60.0	156.2	20	35.5	+60.0	156.3	19	40.5	+60.0	156.5	18	45.5	+60.0	156.6	17	50.4	+60.0	156.8	16
17	23	25.2	+59.9	156.0	22	30.4	+59.9	156.1	21	35.5	+59.9	156.3	20	40.5	+60.0	156.5	19	45.5	+59.9	156.6	18	50.4	+60.0	156.7	17
18	24	25.1	+59.9	155.9	23	30.3	+60.0	156.1	22	35.4	+60.0	156.3	21	40.5	+59.9	156.4	20	45.4	+60.0	156.6	19	50.4	+59.9	156.7	18
19	25	25.0	+60.0	155.9	24	30.3	+59.9	156.0	23	35.4	+59.9	156.2	22	40.4	+60.0	156.4	21	45.4	+60.0	156.6	20	50.3	+60.0	156.9	19
20	26	25.0	+59.9	155.8	25	30.2	+59.9	156.0	24	35.3	+60.0	156.2	23	40.4	+60.0	156.4	22	45.4	+60.0	156.5	21	50.3	+60.0	156.7	20
21	27	24.9	+59.9	155.7	26	30.1	+60.0	155.9	25	35.3	+60.0	156.1	24	40.4	+60.0	156.3	23	45.4	+60.0	156.5	22	50.3	+60.0	156.8	21
22	28	24.8	+59.9	155.7	27	30.1	+59.9	155.9	26	35.3	+59.9	156.1	25	40.4	+59.9	156.3	24	45.4	+60.0	156.5	23	50.2	+60.0	156.8	22
23	29	24.7	+59.9	155.6	28	30.0	+59.9	155.8	27	35.2	+60.0	156.1	26	40.3	+60.0	156.3	25	45.4	+60.0	156.5	24	50.3	+60.0	156.8	23
24	30	24.6	+59.9	155.6	29	29.9	+60.0	155.8	28	35.2	+59.9	156.0	27	40.3	+60.0	156.2	26	45.4	+60.0	156.4	25	50.3	+60.0	156.7	24
25	31	24.5	+59.9	155.5	30	29.9	+59.9	155.7	29	35.1	+60.0	156.0	28	40.3	+59.9	156.2	27	45.3	+60.0	156.4	26	50.3	+60.0	156.8	25
26	32	24.4	+59.9	155.4	31	29.8	+59.9	155.7	30	35.1	+59.9	155.9	29	40.2	+60.0	156.2	28	45.3	+60.0	156.4	27	50.2	+60.0	156.8	26
27	33	24.3	+59.9	155.4	32	29.7	+60.0	155.6	31	35.0	+60.0	155.9	30	40.2	+60.0	156.1	29	45.3	+60.0	156.6	28	50.2	+60.0	156.8	27
28	34	24.2	+59.9	155.3	33	29.7	+59.9	155.6	32	35.0	+59.9	155.8	31	40.2	+60.0	156.1	30	45.3	+60.0	156.3	29	50.2	+60.0	156.7	28
29	35	24.1	+59.9	155.2	34	29.6	+59.9	155.5	33	34.9	+60.0	155.8	32	40.2	+59.9	156.0	31	45.3	+60.0	156.3	30	50.3	+60.0	156.7	29
30	36	24.0	+59.9	155.1	35	29.5	+59.9	155.4	34	34.9	+59.9	155.7	33	40.1	+60.0	156.0	32	45.3	+59.9	156.3	31	50.3	+60.0	156.7	30
31	37	23.9	+59.9	155.1	36	29.4	+60.0	155.4	35	34.8	+60.0	155.7	34	40.1	+60.0	156.0	33	45.2	+60.0	156.2	32	50.3	+60.0	156.7	31
32	38	23.8	+59.9	155.0	37	29.4	+59.9	155.3	36	34.8	+59.9	155.6	35	40.1	+59.9	155.9	34	45.2	+60.0	156.2	33	50.3	+60.0	156.7	32
33	39	23.7	+59.9	154.9	38	29.3	+59.9	155.3	37	34.7	+60.0	155.6	36	40.0	+60.0	155.9	35	45.2	+60.0	156.4	34	50.3	+60.0	156.7	33
34	40	23.6	+59.8	154.8	39	29.2	+59.9	155.2	38	34.7	+59.9	155.5	37	40.0	+60.0	155.8	36	45.2	+60.0	156.1	35	50.2	+60.0	156.7	34
35	41	23.5	+59.8	154.7	40	29.1	+59.9	155.1	39	34.6	+59.9	155.5	38	39.0	+60.0	155.8	37	45.2	+60.0	156.1	36	50.2	+60.0	156.7	35
36	42	23.3	+59.9	154.7	41	29.0	+59.9	155.0	40	34.5	+60.0	155.4	39	39.9	+60.0	155.8	38	45.1	+60.0	156.1	37	50.2	+60.0	156.7	36
37	43	23.2	+59.9	154.6	42	28.9	+59.9	155.0	41	34.5	+59.9	155.3	40	39.9	+60.0	155.7	39	45.1	+60.0	156.1	38	50.2	+60.0	156.7	37
38	44	23.1	+59.8	154.5	43	28.8	+59.9	154.9	42	34.4	+60.0	155.3	41	39.8	+60.0	155.7	40	45.1	+60.0	156.0	39	50.2	+60.0	156.7	38
39	45	22.9	+59.9	154.4	44	28.7	+59.9	154.8	43	34.4	+59.9	155.2	42	39.7	+60.0	155.6	41	45.2	+60.0	156.4	40	50.2	+60.0	156.7	39
40	46	22.8	+59.9	154.3	45	28.6	+59.9	155.2	44	34.3	+59.9	155.5	43	39.8	+60.0	155.9	42	45.0	+60.0	155.9	41	50.2	+60.0	156.7	40
41	47	22.7	+59.8	154.2	46	28.5	+59.9	154.6	45	34.2	+60.0	155.1	44	39.7	+60.0	155.5	43	45.0	+60.0	155.9	42	50.2	+60.0	156.7	41
42	48	22.5	+59.9	154.1	47	28.4	+59.9	154.6	46	34.2	+59.9	155.0	45	39.7	+59.9	155.4	44	45.0	+60.0	155.9	43	50.2	+60.0	156	

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 23° , 337°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z			
0	6 26.5 -60.0	156.8	5 31.3 -60.0	156.9	4 36.1 -60.0	156.9	3 40.9 -60.0	156.9	2 45.7 -60.0	157.0	1 50.5 -60.0	157.0	0 55.2 -60.0	157.0	0 00.0 +60.0	23.0	0 00.0 +60.0	23.0	0 00.0 +60.0	23.0	0 00.0 +60.0	23.0	0 00.0 +60.0	23.0	0		
1	5 26.5 -59.9	156.9	4 31.3 -59.9	156.9	3 36.1 -59.9	157.0	2 40.9 -60.0	157.0	1 45.7 -60.0	157.0	0 50.5 -60.0	157.0	0 04.8 +60.0	23.0	1 00.0 +60.0	23.0	2 00.0 +60.0	23.0	3 00.0 +60.0	23.0	4 00.0 +60.0	23.0	5 00.0 +60.0	23.0	1		
2	4 26.6 -59.9	156.9	3 31.4 -60.0	157.0	2 36.2 -60.0	157.0	1 40.9 -59.9	157.0	0 45.7 -60.0	157.0	0 14.3 +60.0	23.0	1 09.5 +60.0	23.0	2 04.8 +60.0	23.0	3 00.0 +60.0	23.0	4 00.0 +60.0	23.0	5 00.0 +60.0	23.0	2				
3	3 26.7 -60.0	157.0	2 31.4 -59.9	157.0	1 36.2 -60.0	157.0	0 41.0 -60.0	157.0	0 36.2 -59.9	157.1	0 19.0 +60.0	22.9	1 14.3 +60.0	22.9	2 09.5 +60.0	23.0	3 04.8 +60.0	23.0	4 00.0 +60.0	23.0	5 00.0 +60.0	23.0	3				
4	2 26.7 -59.9	157.0	1 31.5 -60.0	157.1	0 31.5 -59.9	157.1	0 23.7 +60.0	22.9	1 19.0 +60.0	22.9	2 14.3 +59.9	22.9	3 09.5 +60.0	22.9	4 04.8 +60.0	23.0	5 00.0 +60.0	23.0	6 00.0 +60.0	23.0	4 00.0 +60.0	23.0	4				
5	1 26.8 -59.9	157.1	0 26.9 -60.0	157.1	0 28.4 +60.0	22.9	1 23.7 +60.0	22.9	2 19.0 +60.0	22.9	3 14.2 +60.0	22.9	4 09.5 +60.0	22.9	5 04.8 +60.0	23.0	6 00.0 +60.0	23.0	7 00.0 +60.0	23.0	8 00.0 +60.0	23.0	9 00.0 +60.0	23.0	9		
6	0 26.9 -60.0	157.1	0 28.4 +60.0	22.9	1 23.7 +60.0	22.9	2 19.0 +60.0	22.9	3 14.2 +60.0	22.9	4 09.5 +60.0	22.9	5 04.8 +60.0	23.0	6 00.0 +60.0	23.0	7 00.0 +60.0	23.0	8 00.0 +60.0	23.0	9 00.0 +60.0	23.0	6				
7	0 33.1 +59.9	22.8	1 28.4 +59.9	22.8	2 23.7 +59.9	22.8	3 19.0 +59.9	22.8	4 14.2 +60.0	22.8	5 09.5 +60.0	22.9	6 04.8 +60.0	22.9	7 04.8 +60.0	22.9	8 00.0 +60.0	23.0	9 00.0 +60.0	23.0	7						
8	1 33.0 +59.9	22.8	2 28.3 +60.0	22.8	3 23.6 +60.0	22.8	4 18.9 +60.0	22.8	5 14.2 +60.0	22.9	6 09.5 +60.0	22.9	7 04.8 +60.0	22.9	8 00.0 +60.0	23.0	9 00.0 +60.0	23.0	8								
9	2 32.9 +60.0	22.7	3 28.3 +59.9	22.7	4 23.6 +60.0	22.8	5 18.9 +60.0	22.8	6 14.2 +60.0	22.8	7 09.5 +60.0	22.9	8 04.8 +60.0	22.9	9 00.0 +60.0	23.0	10 00.0 +60.0	23.0	11 00.0 +60.0	23.0	12 00.0 +60.0	23.0	13 00.0 +60.0	23.0	14 00.0 +60.0	23.0	14
10	3 32.9 +59.9	22.7	4 28.2 +60.0	22.7	5 23.6 +59.9	22.7	6 18.9 +60.0	22.8	7 14.2 +60.0	22.8	8 09.5 +60.0	22.9	9 04.8 +60.0	22.9	10 00.0 +60.0	23.0	11 00.0 +60.0	23.0	12 00.0 +60.0	23.0	13 00.0 +60.0	23.0	14 00.0 +60.0	23.0	15 00.0 +60.0	23.0	10
11	4 32.8 +59.9	22.6	5 28.2 +59.9	22.7	6 23.5 +60.0	22.7	7 18.9 +59.9	22.7	8 14.2 +60.0	22.8	9 09.5 +60.0	22.9	10 04.8 +60.0	22.9	11 00.0 +60.0	23.0	12 00.0 +60.0	23.0	13 00.0 +60.0	23.0	14 00.0 +60.0	23.0	15 00.0 +60.0	23.0	11		
12	5 32.7 +59.9	22.6	6 28.1 +60.0	22.6	7 23.5 +59.9	22.7	8 18.8 +60.0	22.7	9 14.2 +60.0	22.8	10 09.5 +60.0	22.8	11 04.8 +60.0	22.9	12 00.0 +60.0	23.0	13 00.0 +60.0	23.0	14 00.0 +60.0	23.0	15 00.0 +60.0	23.0	12				
13	6 32.6 +60.0	22.5	7 28.1 +59.9	22.6	8 23.4 +60.0	22.6	9 18.8 +60.0	22.7	10 14.2 +59.9	22.8	11 09.5 +60.0	22.8	12 04.8 +60.0	22.9	13 00.0 +60.0	23.0	14 00.0 +60.0	23.0	15 00.0 +60.0	23.0	13						
14	7 32.6 +59.9	22.5	8 28.0 +60.0	22.5	9 23.4 +60.0	22.6	10 18.8 +60.0	22.7	11 14.1 +60.0	22.7	12 09.5 +60.0	22.8	13 04.8 +59.9	22.9	14 00.0 +60.0	23.0	15 00.0 +60.0	23.0	16 00.0 +60.0	23.0	14						
15	8 32.5 +59.9	22.4	9 28.0 +59.9	22.5	10 23.4 +59.9	22.6	11 18.8 +59.9	22.6	12 14.1 +60.0	22.7	13 09.5 +60.0	22.8	14 04.7 +60.0	22.9	15 00.0 +60.0	23.0	16 00.0 +60.0	23.0	17 00.0 +60.0	23.0	18 00.0 +60.0	23.0	19 00.0 +60.0	23.0	19		
16	9 32.4 +60.0	22.4	10 27.9 +60.0	22.5	11 23.3 +60.0	22.5	12 18.7 +60.0	22.6	13 14.1 +60.0	22.7	14 09.5 +59.9	22.8	15 04.7 +60.0	22.9	16 00.0 +60.0	23.0	17 00.0 +60.0	23.0	18 00.0 +60.0	23.0	19 00.0 +60.0	23.0	16				
17	10 32.4 +59.9	22.3	11 27.9 +59.9	22.4	12 23.3 +60.0	22.5	13 18.7 +60.0	22.6	14 14.1 +60.0	22.7	15 09.4 +60.0	22.8	16 04.7 +60.0	22.9	17 00.0 +60.0	23.0	18 00.0 +60.0	23.0	19 00.0 +60.0	23.0	20 00.0 +60.0	23.0	21 00.0 +60.0	23.0	21		
18	11 32.3 +59.9	22.3	12 27.8 +59.9	22.4	13 23.3 +59.9	22.5	14 18.7 +60.0	22.6	15 14.1 +60.0	22.7	16 09.4 +60.0	22.8	17 04.7 +60.0	22.9	18 00.0 +60.0	23.0	19 00.0 +60.0	23.0	20 00.0 +60.0	23.0	21 00.0 +60.0	23.0	22				
19	12 32.2 +60.0	22.2	13 27.7 +60.0	22.3	14 23.2 +60.0	22.4	15 18.7 +60.0	22.5	16 14.1 +60.0	22.6	17 09.4 +60.0	22.7	18 04.7 +60.0	22.8	19 00.0 +60.0	23.0	20 00.0 +60.0	23.0	21 00.0 +60.0	23.0	22 00.0 +60.0	23.0	23				
20	13 32.2 +59.9	22.2	14 27.7 +59.9	22.3	15 23.2 +60.0	22.4	16 18.7 +59.9	22.5	17 14.1 +59.9	22.6	18 09.4 +60.0	22.7	19 04.7 +60.0	22.9	20 00.0 +60.0	23.0	21 00.0 +60.0	23.0	22 00.0 +60.0	23.0	23 00.0 +60.0	23.0	24				
21	14 32.1 +59.9	22.1	15 27.6 +60.0	22.2	16 23.2 +59.9	22.3	17 18.6 +60.0	22.5	18 14.0 +60.0	22.6	19 09.4 +60.0	22.7	20 04.7 +60.0	22.9	21 00.0 +60.0	23.0	22 00.0 +60.0	23.0	23 00.0 +60.0	23.0	24 00.0 +60.0	23.0	25				
22	15 32.0 +59.9	22.1	16 27.6 +59.9	22.2	17 23.1 +60.0	22.3	18 18.6 +60.0	22.4	19 14.0 +60.0	22.6	20 09.4 +60.0	22.7	21 04.7 +60.0	22.8	22 04.7 +60.0	22.8	23 00.0 +60.0	23.0	24 00.0 +60.0	23.0	25 00.0 +60.0	23.0	26				
23	16 31.9 +60.0	22.0	17 27.5 +60.0	22.2	18 23.1 +59.9	22.3	19 18.6 +60.0	22.4	20 14.0 +60.0	22.5	21 09.4 +60.0	22.7	22 04.7 +60.0	22.8	23 00.0 +60.0	23.0	24 00.0 +60.0	23.0	25 00.0 +60.0	23.0	26 00.0 +60.0	23.0	27				
24	17 31.9 +59.9	22.0	18 27.5 +59.9	22.1	19 23.0 +60.0	22.2	20 18.6 +59.9	22.4	21 14.0 +60.0	22.5	22 09.4 +60.0	22.7	23 04.7 +60.0	22.8	24 00.0 +60.0	23.0	25 00.0 +60.0	23.0	26 00.0 +60.0	23.0	27 00.0 +60.0	23.0	28				
25	18 31.8 +59.9	21.9	19 27.4 +60.0	22.1	20 23.0 +60.0	22.2	21 18.5 +60.0	22.3	22 14.0 +60.0	22.5	23 09.4 +60.0	22.7	24 04.7 +60.0	22.8	25 00.0 +60.0	23.0	26 00.0 +60.0	23.0	27 00.0 +60.0	23.0	28 00.0 +60.0	23.0	29				
26	19 31.7 +59.9	21.9	20 27.4 +59.9	22.0	21 23.0 +59.9	22.2	22 18.5 +60.0	22.3	23 14.0 +60.0	22.5	24 09.4 +60.0	22.6	25 04.7 +60.0	22.8	26 00.0 +60.0	23.0	27 00.0 +60.0	23.0	28 00.0 +60.0	23.0	29 00.0 +60.0	23.0	30				
27	20 31.6 +60.0	21.8	21 27.3 +59.9	22.0	22 22.9 +60.0	22.1	23 18.5 +59.9	22.3	24 14.0 +59.9	22.4	25 09.4 +60.0	22.6	26 04.7 +60.0	22.8	27 00.0 +60.0	23.0	28 00.0 +60.0	23.0	29 00.0 +60.0	23.0	30 00.0 +60.0	23.0	31				
28	21 31.6 +59.9	21.8	22 27.2 +60.0	21.9	23 22.9 +59.9	22.1	24 18.4 +60.0	22.2	25 13.9 +60.0	22.4	26 09.4 +60.0	22.6	27 04.7 +60.0	22.8	28 00.0 +60.0	23.0	29 00.0 +60.0	23.0	30 00.0 +60.0	23.0	31 00.0 +60.0	23.0	32				
29	22 31.5 +59.9	21.7	23 27.2 +59.9	21.9	24 22.8 +60.0	22.0	25 18.4 +60.0	22.2	26 13.8 +60.0	22.4	27 09.4 +60.0	22.6	28 04.7 +60.0	22.8	29 00.0 +60.0	23.0	30 00.0 +60.0	23.0	31 00.0 +60.0	23.0	32 00.0 +60.0	23.0	33				
30	23 31.4 +59.9	21.7	24 27.1 +60.0	21.8	25 22.8 +60.0	22.0	26 18.4 +60.0	22.2	27 13.9 +60.0	22.4	28 09.4 +60.0	22.6	29 04.7 +60.0	22.8	30 00.0 +60.0	23.0	31 00.0 +60.0	23.0	32 00.0 +60.0	23.0	33 00.0 +60.0	23.0	34				
31	24 31.3 +59.9	21.6	25 27.1 +59.9	21.8	26 22.8 +59.9	22.0	27 18.4 +59.9	22.1	28 13.9 +60.0	22.3	29 09.4 +59.9	22.5	30 04.7 +60.0	22.7	31 00.0 +60.0	23.0	32 00.0 +60.0	23.0	33 00.0 +60.0	23.0	34 00.0 +60.0	23.0					

24°, 336° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	Dec.				
0	6	23.5	+60.0	155.8	5	28.8	+59.9	155.9	4	34.0	+60.0	155.9	3	39.2	+60.0	155.9	2	44.4	+60.0	156.0	1	49.6	+60.0	156.0	0	00.0	+60.0	156.0	0
1	7	23.5	+59.9	155.8	6	28.7	+60.0	155.8	5	34.0	+59.9	155.9	4	39.2	+60.0	155.9	3	44.4	+60.0	155.9	2	49.6	+60.0	156.0	1	54.8	+60.0	156.0	1
2	8	23.4	+59.9	155.7	7	28.7	+59.9	155.8	6	33.9	+60.0	155.8	5	39.2	+59.9	155.9	4	44.4	+60.0	155.9	3	49.6	+60.0	156.0	2	54.8	+60.0	156.0	2
3	9	23.3	+59.9	155.7	8	28.6	+60.0	155.8	7	33.9	+60.0	155.8	6	39.1	+60.0	155.9	5	44.4	+60.0	155.9	4	49.6	+60.0	155.9	3	54.8	+60.0	156.0	3
4	10	23.2	+60.0	155.6	9	28.6	+59.9	155.7	8	33.9	+59.9	155.8	7	39.1	+60.0	155.8	6	44.4	+60.0	155.9	5	49.6	+60.0	156.0	4	54.8	+60.0	156.0	4
5	11	23.2	+59.8	155.6	10	28.5	+59.9	155.7	9	33.8	+60.0	155.7	8	39.1	+60.0	155.8	7	44.4	+59.9	155.9	6	49.6	+60.0	155.9	5	54.8	+60.0	156.0	5
6	12	23.1	+59.9	155.5	11	28.4	+60.0	155.6	10	33.8	+59.9	155.7	9	39.1	+59.9	155.8	8	44.3	+60.0	155.8	7	49.6	+60.0	155.9	6	54.8	+60.0	156.0	6
7	13	23.0	+59.9	155.5	12	28.4	+59.9	155.6	11	33.7	+60.0	155.7	10	39.0	+60.0	155.7	9	44.3	+60.0	155.8	8	49.6	+60.0	155.9	7	54.8	+60.0	156.0	7
8	14	22.9	+59.9	155.4	13	28.3	+60.0	155.5	12	33.7	+60.0	155.6	11	39.0	+60.0	155.7	10	44.3	+60.0	155.8	9	49.6	+60.0	155.9	8	54.8	+60.0	156.0	8
9	15	22.8	+60.0	155.4	14	28.3	+59.9	155.5	13	33.7	+59.9	155.6	12	39.0	+60.0	155.7	11	44.3	+60.0	155.8	10	49.6	+60.0	155.9	9	54.8	+60.0	156.0	9
10	16	22.8	+59.9	155.3	15	28.2	+60.0	155.4	14	33.6	+60.0	155.6	13	39.0	+59.9	155.7	12	44.3	+60.0	155.8	11	49.6	+60.0	155.9	10	54.8	+60.0	156.0	10
11	17	22.7	+59.9	155.3	16	28.2	+59.9	155.4	15	33.6	+59.9	155.5	14	38.9	+60.0	155.6	13	44.3	+60.0	155.7	12	49.6	+59.9	155.8	11	54.8	+60.0	155.9	11
12	18	22.6	+59.9	155.2	17	28.1	+59.9	155.3	16	33.5	+60.0	155.5	15	38.9	+60.0	155.6	14	44.3	+59.9	155.7	13	49.5	+60.0	155.8	12	54.8	+60.0	156.0	12
13	19	22.5	+59.9	155.2	18	28.0	+60.0	155.3	17	33.5	+60.0	155.4	16	38.9	+60.0	155.6	15	44.2	+60.0	155.7	14	49.5	+60.0	155.8	13	54.8	+60.0	156.0	13
14	20	22.4	+59.9	155.1	19	28.0	+59.9	155.3	18	33.5	+59.9	155.4	17	38.9	+59.9	155.5	16	44.2	+60.0	155.7	15	49.5	+60.0	155.8	14	54.8	+60.0	156.0	14
15	21	22.3	+60.0	155.0	20	27.9	+60.0	155.2	19	33.4	+60.0	155.4	18	38.8	+60.0	155.5	17	44.2	+60.0	155.6	16	49.5	+60.0	155.8	15	54.8	+60.0	156.0	15
16	22	22.3	+59.9	155.0	21	27.9	+59.9	155.2	20	33.4	+59.9	155.3	19	38.8	+60.0	155.5	18	44.2	+60.0	155.6	17	49.5	+60.0	155.8	16	54.8	+60.0	156.0	16
17	23	22.2	+59.9	154.9	22	27.8	+59.9	155.1	21	33.3	+60.0	155.3	20	38.8	+60.0	155.4	19	44.2	+60.0	155.6	18	49.5	+60.0	155.7	17	54.8	+60.0	156.0	17
18	24	22.1	+59.9	154.9	23	27.7	+60.0	155.1	22	33.3	+59.9	155.2	21	38.8	+59.9	155.4	20	44.2	+60.0	155.6	19	49.5	+60.0	155.7	18	54.8	+60.0	156.0	18
19	25	22.0	+59.9	154.8	24	27.7	+59.9	155.0	23	33.2	+60.0	155.2	22	38.7	+60.0	155.4	21	44.2	+59.9	155.5	20	49.5	+60.0	155.7	19	54.8	+60.0	156.0	19
20	26	21.9	+59.9	154.7	25	27.6	+59.9	155.0	24	33.2	+59.9	155.2	23	38.7	+60.0	155.3	22	44.1	+60.0	155.5	21	49.5	+60.0	155.8	20	54.8	+60.0	156.0	20
21	27	21.8	+59.9	154.7	26	27.5	+60.0	154.9	25	33.1	+60.0	155.1	24	38.7	+59.9	155.3	23	44.1	+60.0	155.5	22	49.5	+60.0	155.7	21	54.8	+60.0	156.0	21
22	28	21.7	+59.9	154.6	27	27.5	+59.9	154.8	26	33.1	+60.0	155.1	25	38.6	+60.0	155.3	24	44.1	+60.0	155.5	23	49.5	+60.0	155.7	22	54.8	+60.0	156.0	22
23	29	21.6	+59.9	154.6	28	27.4	+59.9	154.8	27	33.1	+59.9	155.0	26	38.6	+60.0	155.2	25	44.1	+60.0	155.4	24	49.5	+60.0	155.6	23	54.8	+60.0	156.0	23
24	30	21.5	+59.9	154.5	29	27.3	+59.9	154.7	28	33.0	+60.0	155.0	27	38.6	+60.0	155.2	26	44.1	+60.0	155.4	25	49.5	+60.0	155.6	24	54.8	+60.0	156.0	24
25	31	21.4	+59.9	154.4	30	27.2	+60.0	154.7	29	33.0	+59.9	154.9	28	38.6	+59.9	155.2	27	44.1	+59.9	155.4	26	49.5	+60.0	155.6	25	54.8	+60.0	156.0	25
26	32	21.3	+59.9	154.4	31	27.2	+59.9	154.6	30	32.9	+60.0	154.9	29	38.5	+60.0	155.1	28	44.0	+60.0	155.4	27	49.5	+59.9	155.6	26	54.8	+60.0	156.0	26
27	33	21.2	+59.9	154.3	32	27.1	+59.9	154.5	31	32.9	+59.9	154.8	30	38.5	+60.0	155.1	29	44.0	+60.0	155.3	28	49.4	+60.0	155.5	27	54.8	+60.0	156.0	27
28	34	21.1	+59.9	154.2	33	27.0	+59.9	154.5	32	32.8	+59.9	154.8	31	38.5	+59.9	155.0	30	44.0	+60.0	155.3	29	49.4	+60.0	155.5	28	54.8	+60.0	156.0	28
29	35	21.0	+59.9	154.1	34	26.9	+60.0	154.4	33	32.7	+60.0	154.7	32	38.4	+60.0	155.0	31	44.0	+59.9	155.2	30	49.4	+60.0	155.4	29	54.8	+60.0	156.0	29
30	36	20.9	+59.9	154.1	35	26.9	+59.9	154.4	34	32.7	+59.9	154.7	33	38.4	+60.0	155.0	32	44.0	+59.9	155.2	31	49.4	+60.0	155.4	30	54.8	+60.0	156.0	30
31	37	20.8	+59.8	154.0	36	26.8	+59.9	154.3	35	32.6	+60.0	154.6	34	38.4	+59.9	154.9	33	43.9	+60.0	155.1	32	49.4	+60.0	155.3	31	54.8	+60.0	156.0	31
32	38	20.7	+59.8	153.9	37	26.7	+59.9	154.2	36	32.6	+59.9	154.6	35	38.3	+60.0	154.9	34	43.9	+60.0	155.2	33	49.4	+60.0	155.4	32	54.8	+60.0	156.0	32
33	39	20.5	+59.9	153.8	38	26.6	+59.9	154.2	37	32.5	+60.0	154.5	36	38.3	+59.9	154.8	35	43.9	+60.0	155.1	34	49.4	+60.0	155.3	33	54.8	+60.0	156.0	33
34	40	20.4	+59.9	153.7	39	26.5	+59.9	154.1	38	32.5	+59.9	154.4	37	38.2	+60.0	154.8	36	43.9	+60.0	155.1	35	49.4	+60.0	155.4	34	54.8	+60.0	156.0	34
35	41	20.3	+59.8	153.7	40	26.4	+59.9	154.0	39	32.4	+59.9	154.4	38	38.2	+60.0	154.8	37	43.9	+59.9	155.1	36	49.4	+60.0	155.4	35	54.8	+59.9	155.6	35
36	42	20.1	+59.9	153.6	41	26.3	+59.9	154.0	40	32.3	+60.0	154.3	39	38.2	+59.9	154.7	38	43.8	+60.0	155.1	37	49.4	+60.0	155.4	36	54.7	+60.0	156.0	36
37	43	20.0	+59.9	153.5	42	26.2	+59.9																						

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 24°, 336°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	6	23.5	-59.9	155.8	5	28.8	-60.0	155.9	4	34.0	-60.0	155.9	3	39.2	-60.0	155.9	2	44.4	-60.0	156.0	1	49.6	-60.0	156.0	0	54.8	-60.0	156.0	0	0.00	+60.0	24.0	0
1	5	23.6	-59.9	155.9	4	28.8	-59.9	155.9	3	34.0	-59.9	156.0	2	39.2	-59.9	156.0	1	44.4	-59.9	156.0	0	49.6	-60.0	156.0	0	05.2	+60.0	24.0	1				
2	4	23.7	-59.9	155.9	3	28.9	-60.0	156.0	2	34.1	-60.0	156.0	1	39.3	-60.0	156.0	0	44.5	-60.0	156.0	0	10.4	+60.0	24.0	2								
3	3	23.8	-60.0	156.0	2	28.9	-59.9	156.0	1	34.1	-59.9	156.0	0	39.3	-60.0	156.0	0	15.5	+60.0	24.0	2	10.4	+60.0	24.0	3								
4	2	23.8	-59.9	156.0	1	29.0	-60.0	156.1	0	34.2	-60.0	156.1	0	20.7	+60.0	23.9	1	15.5	+60.0	23.9	2	10.4	+59.9	24.0	4								
5	1	23.9	-59.9	156.1	0	29.0	-59.9	156.1	0	25.8	+60.0	23.9	1	20.7	+59.9	23.9	2	15.5	+60.0	23.9	3	10.3	+60.0	23.9	5								
6	0	24.0	-60.0	156.1	0	30.9	+59.9	23.9	1	25.8	+59.9	23.9	2	20.6	+60.0	23.9	3	15.5	+60.0	23.9	4	10.3	+60.0	24.0	6								
7	0	36.0	+59.9	23.8	1	30.8	+60.0	23.8	2	25.7	+60.0	23.8	3	20.6	+60.0	23.9	4	15.5	+60.0	23.9	5	10.3	+60.0	23.9	7								
8	1	35.9	+59.9	23.8	2	30.8	+59.9	23.8	3	25.7	+60.0	23.8	4	20.6	+60.0	23.8	5	15.5	+60.0	23.9	6	10.3	+60.0	23.9	8								
9	2	35.8	+59.9	23.7	3	30.7	+60.0	23.7	4	25.7	+59.9	23.8	5	20.6	+59.9	23.8	6	15.5	+59.9	23.8	7	10.3	+60.0	23.9	9								
10	3	35.7	+60.0	23.7	4	30.7	+59.9	23.7	5	25.6	+60.0	23.7	6	20.5	+60.0	23.8	7	15.4	+60.0	23.8	8	10.3	+60.0	23.9	10								
11	4	35.7	+59.9	23.6	5	30.6	+60.0	23.6	6	25.6	+59.9	23.7	7	20.5	+60.0	23.7	8	15.4	+60.0	23.8	9	10.3	+60.0	23.9	11								
12	5	35.6	+59.9	23.6	6	30.6	+59.9	23.6	7	25.5	+60.0	23.7	8	20.5	+60.0	23.7	10	15.4	+60.0	23.8	11	10.3	+60.0	23.9	12								
13	6	35.5	+59.9	23.5	7	30.5	+60.0	23.6	8	25.5	+60.0	23.6	9	20.5	+59.9	23.7	11	15.4	+60.0	23.8	12	10.3	+60.0	23.9	13								
14	7	35.4	+60.0	23.5	8	30.5	+59.9	23.5	9	25.5	+59.9	23.6	10	20.4	+60.0	23.7	11	15.4	+60.0	23.7	12	10.3	+60.0	23.8	14								
15	8	35.4	+59.9	23.4	9	30.4	+59.9	23.5	10	25.4	+60.0	23.5	11	20.4	+60.0	23.6	12	15.4	+60.0	23.7	13	10.3	+60.0	23.9	15								
16	9	35.3	+59.9	23.4	10	30.3	+60.0	23.4	11	25.4	+59.9	23.5	12	20.4	+60.0	23.6	13	15.4	+59.9	23.7	14	10.3	+60.0	23.9	16								
17	10	35.2	+59.9	23.3	11	30.3	+59.9	23.4	12	25.3	+60.0	23.5	13	20.4	+59.9	23.6	14	15.3	+60.0	23.7	15	10.3	+60.0	23.9	17								
18	11	35.1	+60.0	23.3	12	30.2	+60.0	23.3	13	25.3	+60.0	23.4	14	20.3	+60.0	23.5	15	15.3	+60.0	23.6	16	10.3	+60.0	23.9	18								
19	12	35.1	+59.9	23.2	13	30.2	+59.9	23.3	14	25.3	+59.9	23.4	15	20.3	+60.0	23.5	16	15.3	+60.0	23.6	17	10.3	+60.0	23.9	19								
20	13	35.0	+59.9	23.2	14	30.1	+60.0	23.3	15	25.2	+60.0	23.4	16	20.3	+60.0	23.5	17	15.3	+60.0	23.6	18	10.3	+59.9	23.7	19								
21	14	34.9	+59.9	23.1	15	30.1	+59.9	23.2	16	25.2	+59.9	23.3	17	20.3	+59.9	23.4	18	15.3	+60.0	23.6	19	10.2	+60.0	23.7	21								
22	15	34.8	+59.9	23.0	16	30.0	+59.9	23.2	17	25.1	+60.0	23.3	18	20.2	+60.0	23.4	19	15.3	+59.9	23.5	20	10.2	+60.0	23.7	22								
23	16	34.7	+60.0	23.0	17	29.9	+60.0	23.1	18	25.1	+60.0	23.2	19	20.2	+60.0	23.4	20	15.2	+60.0	23.5	21	10.2	+60.0	23.7	23								
24	17	34.7	+59.9	22.9	18	29.9	+59.9	23.1	19	25.1	+59.9	23.2	20	20.2	+59.9	23.3	21	15.2	+60.0	23.5	22	10.2	+60.0	23.7	24								
25	18	34.6	+59.9	22.9	19	29.8	+60.0	23.0	20	25.0	+60.0	23.2	21	20.1	+60.0	23.3	22	15.2	+60.0	23.5	23	10.2	+60.0	23.7	25								
26	19	34.5	+59.9	22.8	20	29.8	+59.9	23.0	21	25.0	+59.9	23.1	22	20.1	+60.0	23.3	23	15.2	+60.0	23.4	24	10.2	+60.0	23.6	26								
27	20	34.4	+59.9	22.8	21	29.7	+59.9	22.9	22	24.9	+60.0	23.1	23	20.1	+60.0	23.2	24	15.2	+60.0	23.4	25	10.2	+60.0	23.6	27								
28	21	34.3	+59.9	22.7	22	29.6	+60.0	22.9	23	24.9	+59.9	23.0	24	20.1	+59.9	23.2	25	15.2	+60.0	23.4	26	10.2	+60.0	23.6	28								
29	22	34.2	+59.9	22.7	23	29.6	+59.9	22.8	24	24.8	+60.0	23.0	25	20.0	+60.0	23.2	26	15.2	+59.9	23.4	27	10.2	+60.0	23.6	29								
30	23	34.1	+60.0	22.6	24	29.5	+59.9	22.8	25	24.8	+59.9	23.0	26	20.0	+60.0	23.1	27	15.1	+60.0	23.3	28	10.2	+60.0	23.6	30								
31	24	34.1	+59.9	22.5	25	29.4	+60.0	22.7	26	24.7	+60.0	22.9	27	20.0	+59.9	23.1	28	15.1	+60.0	23.3	29	10.1	+60.0	23.6	31								
32	25	34.0	+59.9	22.5	26	29.4	+59.9	22.7	27	24.7	+60.0	22.9	28	19.9	+60.0	23.1	29	15.1	+60.0	23.3	30	10.2	+60.0	23.6	32								
33	26	33.9	+59.9	22.4	27	29.3	+59.9	22.6	28	24.7	+59.9	22.8	29	19.9	+60.0	23.0	30	15.1	+60.0	23.3	31	10.2	+59.9	23.5	33								
34	27	33.8	+59.9	22.4	28	29.2	+60.0	22.6	29	24.6	+60.0	22.8	30	19.9	+59.9	23.0	31	15.1	+59.9	23.2	32	10.1	+60.0	23.5	34								
35	28	33.7	+59.9	22.3	29	29.2	+59.9	22.5	30	24.6	+59.9	22.7	31	19.8	+60.0	23.0	32	15.0	+60.0	23.2	33	10.1	+60.0	23.5	35								
36	29	33.6	+59.9	22.2	30	29.1	+59.9	22.4	31	24.5	+59.9	22.7	32	19.8	+60.0	22.9	33	15.0	+60.0	23.4	34	10.1	+60.0	23.7	36								
37	30	33.5	+59.9	22.2	31	29.0	+59.9	22.4	32	24.4	+60.0	22.6	33	19.8	+59.9	22.9	34	15.0	+60.0	23.5	35	10.1	+60.0	23.8	37								
38	31	33.4	+59.9	22.1	32	28.9	+60.0	22.3	33	24.4	+59.9	22.6	34	19.7	+60.0	22.8	35	15.0	+60.0	23.4	36	10.1	+60.0	23.7	38								
39	32	33.3	+59.9	22.0	33	28.9	+59.9	22.3	34	24.3	+60.0	22.5	35	19.7	+60.0	22.8	36	15.0	+59.9	23.1	37	10.1	+60.0	23.4	39								
40	33	33.2	+59.9	22.0	34	28.8	+59.9	22.2	35	24.3	+59.9	22.5	36	19.7	+59.9	22.8	37	14.9	+60.0	23.0	38	10.1	+60.0	23.3	40								
41	34	33.1	+59.9	21.9	35	28.7	+59.9	22.1	36	24.2	+60.0	22.4	37	19.6	+60.0	22.7	38	14.9	+60.0	23.0	39	10.1	+60.0	23.3	41								
42	35	33.0	+59.9	21.8	36	28.6	+59.9	22.1	37	24.2	+59.9	22.4	38	19.6	+60.0	22.7	39	14.9	+60.0	23.0	40	10.1	+60.0	23.3	42								
43	36	32.9	+59.8	21.7	37	28.5	+60.0	22.0	38	24.1	+59.8	22.3	39	19.6	+59.9	22.6	40	14.9</td															

25°, 335° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.				
0	6	20.5	+59.9	154.8	5	26.2	+59.9	154.9	4	31.8	+60.0	154.9	3	37.5	+60.0	154.9	2	43.1	+60.0	155.0	1	48.8	+59.9	155.0	0	54.4	+60.0	155.0	0
1	7	20.4	+59.9	154.8	6	26.1	+59.9	154.8	5	31.8	+59.9	154.9	4	37.5	+59.9	154.9	3	43.1	+60.0	154.9	2	48.7	+60.0	155.0	1	54.4	+60.0	155.0	1
2	8	20.3	+59.9	154.7	7	26.0	+60.0	154.8	6	31.7	+60.0	154.8	5	37.4	+60.0	154.9	4	43.1	+60.0	154.9	3	48.7	+60.0	155.0	2	54.4	+60.0	155.0	2
3	9	20.2	+60.0	154.7	8	26.0	+59.9	154.7	7	31.7	+60.0	154.8	6	37.4	+60.0	154.9	5	43.1	+60.0	154.9	4	48.7	+60.0	154.9	3	54.4	+60.0	155.0	3
4	10	20.2	+59.9	154.6	9	25.9	+60.0	154.7	8	31.7	+59.9	154.8	7	37.4	+60.0	154.8	6	43.1	+59.9	154.9	5	48.7	+60.0	154.9	4	54.4	+60.0	155.0	4
5	11	20.1	+59.9	154.6	10	25.9	+59.9	154.7	9	31.6	+60.0	154.7	8	37.4	+59.9	154.8	7	43.0	+60.0	154.9	6	48.7	+60.0	154.9	5	54.4	+60.0	155.0	5
6	12	20.0	+59.9	154.5	11	25.8	+59.9	154.6	10	31.6	+59.9	154.7	9	37.3	+60.0	154.8	8	43.0	+60.0	154.9	7	48.7	+60.0	154.9	6	54.4	+60.0	155.0	6
7	13	19.9	+59.9	154.5	12	25.7	+60.0	154.6	11	31.5	+60.0	154.7	10	37.3	+60.0	154.7	9	43.0	+60.0	154.8	8	48.7	+60.0	154.9	7	54.4	+60.0	155.0	7
8	14	19.8	+59.9	154.4	13	25.7	+59.9	154.5	12	31.5	+60.0	154.6	11	37.3	+59.9	154.7	10	43.0	+60.0	154.8	9	48.7	+60.0	154.9	8	54.4	+60.0	155.0	8
9	15	19.7	+59.9	154.4	14	25.6	+60.0	154.5	13	31.5	+59.9	154.6	12	37.2	+60.0	154.7	11	43.0	+60.0	154.8	10	48.7	+60.0	154.9	9	54.4	+60.0	155.0	9
10	16	19.6	+60.0	154.3	15	25.6	+59.9	154.4	14	31.4	+60.0	154.5	13	37.2	+60.0	154.6	12	43.0	+60.0	154.7	11	48.7	+60.0	154.8	10	54.4	+60.0	154.9	10
11	17	19.6	+59.9	154.2	16	25.5	+59.9	154.4	15	31.4	+59.9	154.5	14	37.2	+60.0	154.6	13	43.0	+59.9	154.7	12	48.7	+60.0	154.8	11	54.4	+60.0	154.9	11
12	18	19.5	+59.9	154.2	17	25.4	+60.0	154.3	16	31.3	+60.0	154.5	15	37.2	+59.9	154.6	14	42.9	+60.0	154.7	13	48.7	+60.0	154.8	12	54.4	+60.0	155.0	12
13	19	19.4	+59.9	154.1	18	25.4	+59.9	154.3	17	31.3	+59.9	154.4	16	37.1	+60.0	154.5	15	42.9	+60.0	154.6	14	48.7	+60.0	154.7	13	54.4	+60.0	155.0	13
14	20	19.3	+59.9	154.1	19	25.3	+59.9	154.2	18	31.2	+60.0	154.4	17	37.1	+60.0	154.5	16	42.9	+60.0	154.6	15	48.7	+60.0	154.7	14	54.4	+60.0	155.0	14
15	21	19.2	+59.9	154.0	20	25.2	+60.0	154.2	19	31.2	+59.9	154.3	18	37.1	+59.9	154.5	17	42.9	+60.0	154.6	16	48.7	+59.9	154.8	15	54.4	+60.0	154.9	15
16	22	19.1	+59.9	154.0	21	25.2	+59.9	154.1	20	31.1	+60.0	154.3	19	37.0	+60.0	154.5	18	42.9	+60.0	154.6	17	48.6	+60.0	154.7	16	54.4	+59.9	154.9	16
17	23	19.0	+59.9	153.9	22	25.1	+59.9	154.1	21	31.1	+59.9	154.3	20	37.0	+60.0	154.4	19	42.9	+59.9	154.6	18	48.6	+60.0	154.7	17	54.3	+60.0	154.9	17
18	24	18.9	+59.9	153.8	23	25.0	+60.0	154.0	22	31.0	+60.0	154.2	21	37.0	+60.0	154.4	20	42.8	+60.0	154.6	19	48.6	+60.0	154.7	18	54.3	+60.0	155.0	18
19	25	18.8	+59.9	153.8	24	25.0	+59.9	154.0	23	31.0	+60.0	154.2	22	37.0	+59.9	154.3	21	42.8	+60.0	154.5	20	48.6	+60.0	154.7	19	54.3	+60.0	155.0	19
20	26	18.7	+59.9	153.7	25	24.9	+59.9	153.9	24	31.0	+59.9	154.1	23	36.9	+60.0	154.3	22	42.8	+60.0	154.5	21	48.6	+60.0	154.7	20	54.3	+60.0	155.0	20
21	27	18.6	+59.9	153.6	26	24.8	+59.9	153.9	25	30.9	+60.0	154.1	24	36.9	+60.0	154.3	23	42.8	+60.0	154.5	22	48.6	+60.0	154.7	21	54.3	+60.0	155.0	21
22	28	18.5	+59.9	153.6	27	24.7	+60.0	153.8	26	30.9	+59.9	154.0	25	36.9	+59.9	154.2	24	42.8	+60.0	154.4	23	48.6	+60.0	154.6	22	54.3	+60.0	155.0	22
23	29	18.4	+59.9	153.5	28	24.7	+59.9	153.7	27	30.8	+59.9	154.0	26	36.8	+60.0	154.2	25	42.8	+59.9	154.4	24	48.6	+60.0	154.6	23	54.3	+60.0	155.0	23
24	30	18.3	+59.9	153.4	29	24.6	+59.9	153.7	28	30.7	+60.0	153.9	27	36.8	+60.0	154.2	26	42.7	+60.0	154.4	25	48.6	+60.0	154.6	24	54.3	+60.0	155.0	24
25	31	18.2	+59.9	153.4	30	24.5	+59.9	153.6	29	30.7	+59.9	153.9	28	36.8	+59.9	154.1	27	42.7	+60.0	154.4	26	48.6	+60.0	154.6	25	54.3	+60.0	155.0	25
26	32	18.1	+59.9	153.3	31	24.4	+60.0	153.6	30	30.6	+60.0	153.8	29	36.7	+60.0	154.1	28	42.7	+60.0	154.3	27	48.6	+60.0	154.5	26	54.3	+60.0	155.0	26
27	33	18.0	+59.9	153.2	32	24.4	+59.9	153.5	31	30.6	+59.9	153.8	30	36.7	+60.0	154.1	29	42.7	+60.0	154.3	28	48.6	+60.0	154.5	27	54.3	+60.0	155.0	27
28	34	17.9	+59.9	153.1	33	24.3	+59.9	153.4	32	30.5	+60.0	153.7	31	36.7	+59.9	154.0	30	42.7	+60.0	154.2	29	48.6	+59.9	154.4	28	54.3	+60.0	155.0	28
29	35	17.8	+59.9	153.1	34	24.2	+59.9	153.4	33	30.5	+59.9	153.7	32	36.6	+60.0	154.0	31	42.6	+60.0	154.2	30	48.5	+60.0	154.5	29	54.3	+60.0	155.0	29
30	36	17.6	+59.9	153.0	35	24.1	+59.9	153.3	34	30.4	+59.9	153.6	33	36.6	+59.9	153.9	32	42.6	+60.0	154.2	31	48.5	+60.0	154.5	30	54.3	+60.0	155.0	30
31	37	17.5	+59.8	152.9	36	24.0	+59.9	153.3	35	30.3	+60.0	153.6	34	36.5	+60.0	153.9	33	42.6	+60.0	154.2	32	48.5	+60.0	154.5	31	54.3	+60.0	155.0	31
32	38	17.4	+59.8	152.8	37	23.9	+59.9	153.2	36	30.3	+59.9	153.5	35	36.5	+60.0	153.8	34	42.6	+60.0	154.2	33	48.5	+60.0	154.5	32	54.3	+60.0	155.0	32
33	39	17.2	+59.8	152.7	38	23.8	+59.9	153.1	37	30.2	+60.0	153.5	36	36.5	+59.9	153.8	35	42.6	+60.0	154.1	34	48.5	+60.0	154.4	33	54.3	+60.0	155.0	33
34	40	17.1	+59.8	152.7	39	23.7	+59.9	153.0	38	30.2	+59.9	153.3	37	36.4	+59.9	153.6	36	42.5	+60.0	154.1	35	48.5	+60.0	154.4	34	54.3	+60.0	155.0	34
35	41	17.0	+59.8	152.6	40	23.6	+59.9	153.0	39	30.1	+59.9	153.3	38	36.4	+59.9	153.7	37	42.5	+60.0	154.1	36	48.5	+60.0	154.4	35	54.3	+60.0	155.0	35
36	42	16.8	+59.9	152.5	41	23.5	+59.9	152.9	40	30.0	+59.9	153.3	39	36.3	+60.0	153.7	38	42.5	+60.0	154.0	37	48.5	+60.0	154.3	36	54.3	+60.0	155.0	36
37	43	16.7	+59.8	152.4	42	23																							

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 25° , 335°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	6	20.5	-59.9	154.8	5	26.2	-60.0	154.9	4	31.8	-59.9	154.9	3	37.5	-60.0	154.9	2	43.1	-60.0	155.0	1	48.8	-60.0	155.0	0	54.4	-60.0	155.0	0	0.00	+60.0	25.0	0
1	5	20.6	-60.0	154.9	4	26.2	-59.9	154.9	3	31.9	-60.0	155.0	2	37.5	-60.0	155.0	1	43.1	-59.9	155.0	0	48.8	-60.0	155.0	0	05.6	+60.0	25.0	1				
2	4	20.6	-59.9	154.9	3	26.3	-60.0	155.0	2	31.9	-59.9	155.0	1	37.5	-59.9	155.0	0	43.2	-60.0	155.0	0	11.2	+60.0	25.0	2	00.0	+60.0	25.0	2				
3	3	20.7	-59.9	155.0	2	26.3	-59.9	155.0	1	32.0	-60.0	155.0	0	37.6	-60.0	155.0	0	16.8	+60.0	25.0	1	11.2	+60.0	25.0	3	00.0	+60.0	25.0	3				
4	2	20.8	-59.9	155.0	1	26.4	-59.9	155.1	0	32.0	-60.0	155.1	0	22.4	+60.0	24.9	1	16.8	+60.0	24.9	2	11.2	+60.0	25.0	3	05.6	+60.0	25.0	4				
5	1	20.9	-59.9	155.1	0	26.5	-60.0	155.1	0	28.0	+59.9	24.9	1	22.4	+60.0	24.9	2	16.8	+60.0	24.9	4	5.6	+60.0	25.0	5	00.0	+60.0	25.0	5				
6	0	21.0	-60.0	155.1	0	33.5	+59.9	24.9	1	27.9	+60.0	24.9	2	22.4	+59.9	24.9	3	16.8	+60.0	24.9	4	11.2	+60.0	24.9	5	05.6	+60.0	25.0	6				
7	0	39.0	+59.9	24.8	1	33.4	+60.0	24.8	2	27.9	+59.9	24.8	3	22.3	+60.0	24.8	4	16.8	+60.0	24.9	5	11.2	+60.0	24.9	6	00.0	+60.0	25.0	7				
8	1	38.9	+59.9	24.8	2	33.4	+59.9	24.8	3	27.8	+60.0	24.8	4	22.3	+60.0	24.8	5	16.8	+59.9	24.9	6	11.2	+60.0	24.9	7	05.6	+60.0	25.0	8				
9	2	38.8	+59.9	24.7	3	33.3	+59.9	24.7	4	27.8	+60.0	24.8	5	22.3	+60.0	24.8	6	16.7	+60.0	24.8	7	11.2	+60.0	24.9	8	05.6	+60.0	25.0	9				
10	3	38.7	+59.9	24.6	4	33.2	+60.0	24.7	5	27.8	+59.9	24.7	6	22.3	+59.9	24.8	7	16.7	+60.0	24.8	8	11.2	+60.0	24.9	9	05.6	+60.0	24.9	10				
11	4	38.6	+60.0	24.6	5	33.2	+59.9	24.6	6	27.7	+60.0	24.7	7	22.2	+60.0	24.7	8	16.7	+60.0	24.8	9	11.2	+60.0	24.9	10	05.6	+60.0	25.0	11				
12	5	38.6	+59.9	24.5	6	33.1	+60.0	24.6	7	27.7	+59.9	24.6	8	22.2	+60.0	24.7	9	16.7	+60.0	24.8	10	11.2	+60.0	24.9	11	05.6	+60.0	25.0	12				
13	6	38.5	+59.9	24.5	7	33.1	+59.9	24.5	8	27.6	+60.0	24.6	9	22.2	+59.9	24.7	10	16.7	+60.0	24.7	11	11.2	+60.0	24.8	12	05.6	+60.0	25.0	13				
14	7	38.4	+59.9	24.4	8	33.0	+60.0	24.5	9	27.6	+60.0	24.6	10	22.1	+60.0	24.6	11	16.7	+60.0	24.7	12	11.2	+59.9	24.8	13	05.6	+60.0	25.0	14				
15	8	38.3	+59.9	24.4	9	33.0	+59.9	24.5	10	27.6	+59.9	24.5	11	22.1	+60.0	24.6	12	16.7	+59.9	24.7	13	11.1	+60.0	24.8	14	05.6	+60.0	24.9	15				
16	9	38.2	+60.0	24.3	10	32.9	+59.9	24.4	11	27.5	+60.0	24.5	12	22.1	+60.0	24.6	13	16.6	+60.0	24.7	14	11.1	+60.0	24.8	15	05.6	+60.0	25.0	16				
17	10	38.2	+59.9	24.3	11	32.8	+60.0	24.4	12	27.5	+59.9	24.4	13	22.1	+59.9	24.5	14	16.6	+60.0	24.6	15	11.1	+60.0	24.7	16	05.6	+60.0	25.0	17				
18	11	38.1	+59.9	24.2	12	32.8	+59.9	24.3	13	27.4	+60.0	24.4	14	22.0	+60.0	24.5	15	16.6	+60.0	24.6	16	11.1	+60.0	24.7	17	05.6	+60.0	25.0	18				
19	12	38.0	+59.9	24.2	13	32.7	+59.9	24.3	14	27.4	+59.9	24.4	15	22.0	+60.0	24.5	16	16.6	+60.0	24.6	17	11.1	+60.0	24.7	18	05.6	+60.0	25.0	19				
20	13	37.9	+59.9	24.1	14	32.6	+60.0	24.2	15	27.3	+60.0	24.3	16	22.0	+60.0	24.5	17	16.6	+60.0	24.6	18	11.1	+60.0	24.7	19	05.6	+60.0	25.0	20				
21	14	37.8	+59.9	24.1	15	32.6	+59.9	24.2	16	27.3	+60.0	24.3	17	22.0	+59.9	24.4	18	16.6	+59.9	24.6	19	11.1	+60.0	24.7	20	05.6	+60.0	24.8	21				
22	15	37.7	+59.9	24.0	16	32.5	+60.0	24.1	17	27.3	+59.9	24.3	18	21.9	+60.0	24.4	19	16.5	+60.0	24.5	20	11.1	+60.0	24.7	21	05.6	+60.0	25.0	22				
23	16	37.6	+60.0	24.0	17	32.5	+59.9	24.1	18	27.2	+60.0	24.2	19	21.9	+60.0	24.4	20	16.5	+60.0	24.5	21	11.1	+60.0	24.7	22	05.6	+60.0	25.0	23				
24	17	37.6	+59.9	23.9	18	32.4	+59.9	24.0	19	27.2	+59.9	24.2	20	21.9	+59.9	24.3	21	16.5	+60.0	24.5	22	11.1	+60.0	24.6	23	05.6	+60.0	25.0	24				
25	18	37.5	+59.9	23.8	19	32.3	+60.0	24.0	20	27.1	+60.0	24.1	21	21.8	+60.0	24.3	22	16.5	+60.0	24.5	23	11.1	+60.0	24.6	24	05.6	+60.0	25.0	25				
26	19	37.4	+59.9	23.8	20	32.3	+59.9	23.9	21	27.1	+59.9	24.1	22	21.8	+60.0	24.3	23	16.5	+60.0	24.4	24	11.1	+60.0	24.6	25	05.6	+60.0	25.0	26				
27	20	37.3	+59.9	23.7	21	32.2	+59.9	23.9	22	27.0	+60.0	24.0	23	21.8	+59.9	24.2	24	16.5	+59.9	24.4	25	11.1	+60.0	24.6	26	05.6	+60.0	25.0	27				
28	21	37.2	+59.9	23.7	22	32.1	+60.0	23.8	23	27.0	+59.9	24.0	24	21.7	+60.0	24.2	25	16.4	+60.0	24.4	26	11.1	+60.0	24.6	27	05.6	+60.0	25.0	28				
29	22	37.1	+59.9	23.6	23	32.1	+59.9	23.8	24	26.9	+60.0	24.0	25	21.7	+60.0	24.3	26	16.4	+60.0	24.6	27	11.0	+60.0	24.7	28	05.6	+60.0	25.0	29				
30	23	37.0	+59.9	23.5	24	32.0	+59.9	23.7	25	26.9	+59.9	23.9	26	21.7	+59.9	24.1	27	16.4	+60.0	24.3	28	11.0	+60.0	24.5	29	05.6	+60.0	25.0	30				
31	24	36.9	+59.9	23.5	25	31.9	+59.9	23.7	26	26.8	+60.0	23.9	27	21.6	+60.0	24.1	28	16.4	+60.0	24.3	29	11.0	+60.0	24.5	30	05.6	+60.0	25.0	31				
32	25	36.8	+59.9	23.4	26	31.8	+60.0	23.6	27	26.8	+59.9	23.8	28	21.6	+60.0	24.0	29	16.4	+59.9	24.2	30	11.0	+60.0	24.4	31	05.6	+60.0	25.0	32				
33	26	36.7	+59.9	23.4	27	31.8	+59.9	23.6	28	26.7	+60.0	23.8	29	21.6	+59.9	24.0	30	16.3	+60.0	24.2	31	11.0	+60.0	24.4	32	05.6	+60.0	25.0	33				
34	27	36.6	+59.9	23.3	28	31.7	+59.9	23.5	29	26.7	+59.9	23.7	30	21.5	+60.0	24.0	31	16.3	+60.0	24.2	32	11.0	+60.0	24.4	33	05.6	+60.0	25.0	34				
35	28	36.5	+59.9	23.2	29	31.6	+59.9	23.4	30	26.6	+60.0	23.7	31	21.5	+60.0	23.9	32	16.3	+60.0	24.2	33	11.0	+60.0	24.4	34	05.6	+60.0	25.0	35				
36	29	36.4	+59.9	23.2	30	31.5	+60.0	23.4	31	26.6	+59.9	23.6	32	21.5	+59.9	23.9	33	16.3	+60.0	24.1	34	11.0	+60.0	24.4	35	05.6	+60.0	25.0	36				
37	30	36.3	+59.9	23.1	31	31.5	+59.9	23.3	32	26.5	+59.9	23.6	33	21.4	+60.0	23.8	34	16.3	+59.9	24.1	35	11.0	+60.0	24.4	36	05.6	+60.0	25.0	37				
38	31	36.2	+59.9	23.0	32																												

26°, 334° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	Dec.				
0	6	17.3	+59.9	153.8	5	23.5	+59.9	153.9	4	29.6	+59.9	153.9	3	35.7	+59.9	153.9	2	41.8	+60.0	154.0	1	47.9	+59.9	154.0	0	53.9	+60.0	154.0	0
1	7	17.2	+59.9	153.8	6	23.4	+59.9	153.8	5	29.5	+60.0	153.9	4	35.6	+60.0	153.9	3	41.8	+59.9	153.9	2	47.8	+60.0	154.0	1	53.9	+60.0	154.0	1
2	8	17.1	+60.0	153.7	7	23.3	+60.0	153.8	6	29.5	+59.9	153.8	5	35.6	+60.0	153.9	4	41.7	+60.0	153.9	3	47.8	+60.0	154.0	2	53.9	+60.0	154.0	2
3	9	17.1	+59.9	153.7	8	23.3	+59.9	153.7	7	29.4	+60.0	153.8	6	35.6	+60.0	153.9	5	41.7	+60.0	153.9	4	47.8	+60.0	153.9	3	53.9	+60.0	154.0	3
4	10	17.0	+59.9	153.6	9	23.2	+59.9	153.7	8	29.4	+59.9	153.8	7	35.6	+59.9	153.8	6	41.7	+60.0	153.9	5	47.8	+60.0	153.9	4	53.9	+60.0	154.0	4
5	11	16.9	+59.9	153.6	10	23.1	+60.0	153.6	9	29.3	+60.0	153.7	8	35.5	+60.0	153.8	7	41.7	+60.0	153.9	6	47.8	+60.0	153.9	5	53.9	+60.0	154.0	5
6	12	16.8	+59.9	153.5	11	23.1	+59.9	153.6	10	29.3	+60.0	153.7	9	35.5	+60.0	153.8	8	41.7	+60.0	153.9	7	47.8	+60.0	154.0	6	53.9	+60.0	154.0	6
7	13	16.7	+59.9	153.4	12	23.0	+59.9	153.5	11	29.3	+59.9	153.6	10	35.5	+59.9	153.7	9	41.7	+59.9	153.8	8	47.8	+60.0	153.9	7	53.9	+60.0	154.0	7
8	14	16.6	+59.9	153.4	13	22.9	+60.0	153.5	12	29.2	+60.0	153.6	11	35.4	+60.0	153.7	10	41.6	+60.0	153.8	9	47.8	+60.0	153.9	8	53.9	+60.0	154.0	8
9	15	16.5	+59.9	153.3	14	22.9	+59.9	153.4	13	29.2	+59.9	153.6	12	35.4	+60.0	153.7	11	41.6	+60.0	153.8	10	47.8	+60.0	153.9	9	53.9	+60.0	154.0	9
10	16	16.4	+59.9	153.3	15	22.8	+59.9	153.4	14	29.1	+60.0	153.5	13	35.4	+60.0	153.6	12	41.6	+60.0	153.7	11	47.8	+60.0	153.8	10	53.9	+60.0	153.9	10
11	17	16.3	+59.9	153.2	16	22.7	+60.0	153.4	15	29.1	+59.9	153.5	14	35.4	+59.9	153.6	13	41.6	+60.0	153.7	12	47.8	+60.0	153.8	11	53.9	+60.0	154.0	11
12	18	16.2	+59.9	153.2	17	22.7	+59.9	153.3	16	29.0	+60.0	153.4	15	35.3	+60.0	153.6	14	41.6	+60.0	153.7	13	47.8	+60.0	153.8	12	53.9	+60.0	154.0	12
13	19	16.1	+59.9	153.1	18	22.6	+59.9	153.3	17	29.0	+59.9	153.4	16	35.3	+60.0	153.5	15	41.6	+59.9	153.7	14	47.8	+60.0	153.8	13	53.9	+60.0	154.0	13
14	20	16.0	+59.9	153.0	19	22.5	+60.0	153.2	18	28.9	+60.0	153.4	17	35.3	+59.9	153.5	16	41.5	+60.0	153.6	15	47.7	+60.0	153.8	14	53.9	+60.0	154.0	14
15	21	15.9	+59.9	153.0	20	22.5	+59.9	153.1	19	28.9	+59.9	153.3	18	35.2	+60.0	153.5	17	41.5	+60.0	153.6	16	47.7	+60.0	153.7	15	53.9	+60.0	153.9	15
16	22	15.8	+59.9	152.9	21	22.4	+59.9	153.1	20	28.8	+60.0	153.3	19	35.2	+60.0	153.4	18	41.5	+60.0	153.6	17	47.7	+60.0	153.7	16	53.9	+60.0	154.0	16
17	23	15.7	+59.9	152.9	22	22.3	+59.9	153.0	21	28.8	+59.9	153.2	20	35.2	+59.9	153.4	19	41.5	+60.0	153.6	18	47.7	+60.0	153.7	17	53.9	+60.0	154.0	17
18	24	15.6	+59.9	152.8	23	22.2	+60.0	153.0	22	28.7	+60.0	153.2	21	35.1	+60.0	153.4	20	41.5	+60.0	153.5	19	47.7	+60.0	153.7	18	53.9	+60.0	154.0	18
19	25	15.5	+59.9	152.7	24	22.2	+59.9	152.9	23	28.7	+59.9	153.1	22	35.1	+60.0	153.3	21	41.5	+59.9	153.5	20	47.7	+60.0	153.7	19	53.9	+60.0	154.0	19
20	26	15.4	+59.9	152.7	25	22.1	+59.9	152.9	24	28.6	+60.0	153.1	23	35.1	+59.9	153.3	22	41.4	+60.0	153.5	21	47.7	+60.0	153.7	20	53.9	+60.0	154.0	20
21	27	15.3	+59.9	152.6	26	22.0	+59.9	152.8	25	28.6	+59.9	153.0	24	35.0	+60.0	153.2	23	41.4	+60.0	153.4	22	47.7	+60.0	153.6	21	53.9	+60.0	154.0	21
22	28	15.2	+59.9	152.5	27	21.9	+59.9	152.8	26	28.5	+59.9	152.9	25	35.0	+60.0	153.2	24	41.4	+60.0	153.4	23	47.7	+60.0	153.6	22	53.9	+60.0	154.0	22
23	29	15.1	+59.9	152.5	28	21.8	+60.0	152.7	27	28.5	+59.9	152.9	26	35.0	+59.9	153.2	25	41.4	+60.0	153.4	24	47.7	+60.0	153.6	23	53.9	+60.0	154.0	23
24	30	15.0	+59.9	152.4	29	21.8	+59.9	152.6	28	28.4	+59.9	152.9	27	34.9	+60.0	153.1	26	41.4	+59.9	153.4	25	47.7	+60.0	153.6	24	53.9	+60.0	154.0	24
25	31	14.9	+59.9	152.3	30	21.7	+59.9	152.6	29	28.3	+60.0	152.8	28	34.9	+60.0	153.1	27	41.3	+60.0	153.3	26	47.7	+60.0	153.5	25	53.9	+60.0	154.0	25
26	32	14.8	+59.8	152.2	31	21.6	+59.9	152.5	30	28.3	+59.9	152.8	29	34.9	+59.9	153.1	28	41.3	+60.0	153.3	27	47.7	+59.9	153.5	26	53.9	+60.0	154.0	26
27	33	14.6	+59.9	152.2	32	21.5	+59.9	152.5	31	28.2	+60.0	152.7	30	34.8	+60.0	153.0	29	41.3	+60.0	153.3	28	47.6	+60.0	153.5	27	53.9	+60.0	154.0	27
28	34	14.5	+59.9	152.1	33	21.4	+59.9	152.4	32	28.2	+59.9	152.7	31	34.8	+59.9	153.0	30	41.3	+60.0	153.2	29	47.6	+60.0	153.4	28	53.9	+60.0	154.0	28
29	35	14.4	+59.8	152.0	34	21.3	+59.9	152.3	33	28.1	+59.9	152.6	32	34.7	+60.0	152.9	31	41.3	+59.9	153.2	30	47.6	+60.0	153.4	29	53.9	+60.0	154.0	29
30	36	14.2	+59.9	151.9	35	21.2	+59.9	152.3	34	28.0	+60.0	152.6	33	34.7	+60.0	152.9	32	41.2	+60.0	153.2	31	47.6	+60.0	153.5	30	53.9	+60.0	154.0	30
31	37	14.1	+59.8	151.8	36	21.1	+59.9	152.2	35	28.0	+59.9	152.5	34	34.7	+59.9	152.8	33	41.2	+60.0	153.4	32	47.6	+60.0	153.7	31	53.9	+60.0	154.0	31
32	38	14.0	+59.8	151.8	37	21.0	+59.9	152.1	36	27.9	+59.9	152.5	35	34.6	+60.0	152.8	34	41.2	+60.0	153.1	33	47.6	+60.0	153.4	32	53.9	+60.0	154.0	32
33	39	13.8	+59.9	151.7	38	20.9	+59.9	152.0	37	27.8	+60.0	152.4	36	34.6	+59.9	152.7	35	41.3	+60.0	153.0	34	47.6	+60.0	153.3	33	53.9	+60.0	154.0	33
34	40	13.7	+59.8	151.6	39	20.8	+59.9	151.9	38	27.7	+59.9	152.2	37	34.5	+59.9	152.5	36	41.1	+60.0	152.8	35	47.6	+60.0	153.1	34	53.9	+60.0	154.0	34
35	41	13.5	+59.9	151.5	40	20.7	+59.9	151.9	39	27.7	+59.9	152.3	38	34.5	+59.9	152.7	37	41.1	+60.0	153.0	36	47.6	+60.0	153.4	35	53.9	+60.0	154.0	35
36	42	13.4	+59.8	151.4	41	20.6	+59.9	151.8	40	27.6	+59.9	152.2	39	34.4	+60.0	152.6	38	41.1	+60.0	153.0	37	47.6	+59.9	153.3	36	53.9	+60.0	154.0	36
37	43	13.2	+59.9	151.3	42	20.5	+59.9																						

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 26° , 334°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	6	17.3	-59.9	153.8	5	23.5	-60.0	153.9	4	29.6	-60.0	153.9	3	35.7	-60.0	153.9	2	41.8	-60.0	154.0	1	47.9	-60.0	154.0	0	53.9	-60.0	154.0	0	0.00	+60.0	26.0	0
1	5	17.4	-59.9	153.9	4	23.5	-59.9	153.9	3	29.6	-59.9	154.0	2	35.7	-60.0	154.0	1	41.8	-60.0	154.0	0	47.9	-60.0	154.0	0	06.1	+60.0	26.0	1				
2	4	17.5	-59.9	153.9	3	23.6	-60.0	154.0	2	29.7	-60.0	154.0	1	35.7	-59.9	154.0	0	41.8	-60.0	154.0	0	12.1	+60.0	26.0	2	00.0	+60.0	26.0	2				
3	3	17.6	-59.9	154.0	2	23.6	-59.9	154.0	1	29.7	-60.0	154.0	0	35.8	-60.0	154.0	0	18.2	+60.0	26.0	1	12.1	+60.0	26.0	2	06.1	+60.0	26.0	3				
4	2	17.7	-60.0	154.0	1	23.7	-59.9	154.1	0	29.7	-59.9	154.1	0	24.2	+60.0	25.9	1	18.2	+60.0	25.9	2	12.1	+60.0	26.0	3	06.1	+60.0	26.0	4				
5	1	17.7	-59.9	154.1	0	23.8	-60.0	154.1	0	30.2	+60.0	25.9	1	24.2	+60.0	25.9	2	18.2	+59.9	25.9	3	12.1	+60.0	25.9	4	06.1	+60.0	26.0	5				
6	0	17.8	-59.9	154.2	0	36.2	+59.9	25.8	1	30.2	+59.9	25.9	2	24.2	+59.9	25.9	3	18.1	+60.0	25.9	4	12.1	+60.0	25.9	5	06.1	+60.0	26.0	6				
7	0	42.1	+59.9	25.8	1	36.1	+59.9	25.8	2	30.1	+60.0	25.8	3	24.1	+60.0	25.8	4	18.1	+60.0	25.9	5	12.1	+60.0	25.9	6	06.1	+60.0	26.0	7				
8	1	42.0	+59.9	25.7	2	36.0	+60.0	25.8	3	30.1	+59.9	25.8	4	24.1	+60.0	25.8	5	18.1	+60.0	25.8	6	12.1	+60.0	25.9	7	00.0	+60.0	26.0	8				
9	2	41.9	+59.9	25.7	3	36.0	+59.9	25.7	4	30.0	+60.0	25.7	5	24.1	+59.9	25.8	6	18.1	+60.0	25.8	7	12.1	+60.0	25.9	8	06.1	+60.0	26.0	9				
10	3	41.8	+59.9	25.6	4	35.9	+60.0	25.7	5	30.0	+59.9	25.7	6	24.0	+60.0	25.7	7	18.1	+60.0	25.8	8	12.1	+60.0	25.9	9	06.1	+60.0	25.9	10				
11	4	41.7	+60.0	25.6	5	35.9	+59.9	25.6	6	29.9	+60.0	25.7	7	24.0	+60.0	25.7	8	18.1	+59.9	25.8	9	12.1	+60.0	25.9	10	06.1	+60.0	25.9	11				
12	5	41.7	+59.9	25.5	6	35.8	+59.9	25.6	7	29.9	+60.0	25.6	8	24.0	+60.0	25.7	9	18.0	+60.0	25.8	10	12.1	+60.0	25.9	11	06.1	+60.0	26.0	12				
13	6	41.6	+59.9	25.5	7	35.7	+60.0	25.5	8	29.9	+59.9	25.6	9	24.0	+59.9	25.7	10	18.0	+60.0	25.7	11	12.1	+59.9	25.8	12	06.0	+60.0	25.9	13				
14	7	41.5	+59.9	25.4	8	35.7	+59.9	25.5	9	29.8	+60.0	25.5	10	23.9	+60.0	25.6	11	18.0	+60.0	25.7	12	12.0	+60.0	25.8	13	06.0	+60.0	25.9	14				
15	8	41.4	+59.9	25.4	9	35.6	+59.9	25.4	10	29.8	+59.9	25.5	11	23.9	+60.0	25.6	12	18.0	+60.0	25.7	13	12.0	+60.0	25.8	14	06.0	+60.0	25.9	15				
16	9	41.3	+59.9	25.3	10	35.5	+60.0	25.4	11	29.7	+60.0	25.5	12	23.9	+59.9	25.6	13	18.0	+60.0	25.7	14	12.0	+60.0	25.8	15	06.0	+60.0	26.0	16				
17	10	41.2	+59.9	25.3	11	35.5	+59.9	25.3	12	29.7	+59.9	25.4	13	23.8	+60.0	25.5	14	18.0	+59.9	25.6	15	12.0	+60.0	25.7	16	06.0	+60.0	26.0	17				
18	11	41.1	+59.9	25.2	12	35.4	+59.9	25.3	13	29.6	+60.0	25.4	14	23.8	+60.0	25.5	15	17.9	+60.0	25.6	16	12.0	+60.0	25.7	17	06.0	+60.0	25.9	18				
19	12	41.0	+59.9	25.1	13	35.3	+60.0	25.2	14	29.6	+59.9	25.3	15	23.8	+59.9	25.5	16	17.9	+60.0	25.6	17	12.0	+60.0	25.7	18	06.0	+60.0	25.9	19				
20	13	40.9	+60.0	25.1	14	35.3	+59.9	25.2	15	29.5	+60.0	25.3	16	23.7	+60.0	25.4	17	17.9	+60.0	25.6	18	12.0	+60.0	25.7	19	06.0	+60.0	25.8	20				
21	14	40.9	+59.9	25.0	15	35.2	+59.9	25.1	16	29.5	+59.9	25.2	17	23.7	+60.0	25.4	18	17.9	+60.0	25.5	19	12.0	+60.0	25.7	20	06.0	+60.0	25.8	21				
22	15	40.8	+59.9	25.0	16	35.1	+60.0	25.1	17	29.4	+60.0	25.2	18	23.7	+60.0	25.4	19	17.9	+60.0	25.5	20	12.0	+60.0	25.7	21	06.0	+60.0	26.0	22				
23	16	40.7	+59.9	24.9	17	35.1	+59.9	25.0	18	29.4	+59.9	25.2	19	23.7	+59.9	25.3	20	17.9	+59.9	25.5	21	12.0	+60.0	25.6	22	06.0	+60.0	26.0	23				
24	17	40.6	+59.9	24.9	18	35.0	+59.9	25.0	19	29.3	+60.0	25.1	20	23.6	+60.0	25.3	21	17.8	+60.0	25.5	22	12.0	+60.0	25.6	23	06.0	+60.0	26.0	24				
25	18	40.5	+59.9	24.8	19	34.9	+59.9	24.9	20	29.3	+59.9	25.1	21	23.6	+60.0	25.3	22	17.8	+60.0	25.4	23	12.0	+60.0	25.6	24	06.0	+60.0	25.8	25				
26	19	40.4	+59.9	24.7	20	34.8	+60.0	24.9	21	29.2	+60.0	25.1	22	23.6	+59.9	25.2	23	17.8	+60.0	25.4	24	12.0	+59.9	25.6	25	06.0	+60.0	26.0	26				
27	20	40.3	+59.9	24.7	21	34.8	+59.9	24.8	22	29.2	+59.9	25.0	23	23.5	+60.0	25.2	24	17.8	+60.0	25.4	25	11.9	+60.0	25.6	26	06.0	+60.0	26.0	27				
28	21	40.2	+59.9	24.6	22	34.7	+59.9	24.8	23	29.1	+60.0	25.0	24	23.5	+60.0	25.2	25	17.8	+59.9	25.3	26	11.9	+60.0	25.6	27	08.0	+60.0	26.0	28				
29	22	40.1	+59.9	24.6	23	34.6	+60.0	24.7	24	29.1	+59.9	24.9	25	23.5	+59.9	25.1	26	17.7	+60.0	25.3	27	11.9	+60.0	25.5	28	08.0	+60.0	26.0	29				
30	23	40.0	+59.9	24.5	24	34.6	+59.9	24.7	25	29.0	+60.0	24.9	26	23.4	+60.0	25.1	27	17.7	+60.0	25.3	28	11.9	+60.0	25.5	29	06.0	+60.0	25.8	30				
31	24	39.9	+59.9	24.4	25	34.5	+59.9	24.6	26	29.0	+59.9	24.8	27	23.4	+60.0	25.0	28	17.7	+60.0	25.3	29	11.9	+60.0	25.7	30	06.0	+60.0	26.0	31				
32	25	39.8	+59.9	24.4	26	34.4	+59.9	24.6	27	28.9	+60.0	24.8	28	23.4	+59.9	25.0	29	17.7	+60.0	25.2	30	11.9	+60.0	25.5	31	06.0	+60.0	26.0	32				
33	26	39.7	+59.9	24.3	27	34.3	+59.9	24.5	28	28.9	+59.9	24.7	29	23.3	+60.0	25.0	30	17.7	+59.9	25.2	31	11.9	+60.0	25.5	32	06.0	+60.0	26.0	33				
34	27	39.6	+59.9	24.2	28	34.2	+60.0	24.4	29	28.8	+60.0	24.7	30	23.3	+59.9	24.9	31	17.6	+60.0	25.2	32	11.9	+60.0	25.4	33	06.0	+60.0	26.0	34				
35	28	39.5	+59.8	24.2	29	34.2	+59.9	24.4	30	28.8	+59.9	24.6	31	23.2	+60.0	24.9	32	17.6	+60.0	25.1	33	11.9	+60.0	25.4	34	06.0	+60.0	25.7	35				
36	29	39.3	+59.9	24.1	30	34.1	+59.9	24.3	31	28.7	+59.9	24.6	32	23.2	+60.0	24.8	33	17.6	+60.0	25.1	34	11.9	+60.0	25.4	35	06.0	+60.0	25.7	36				
37	30	39.2	+59.9	24.0	31	34.0	+59.9	24.3	32	28.6	+60.0	24.6	33	23.2	+59.9	24.8	34	17.6	+59.9	25.1	35	11.9	+60.0	25.4	36	06.0	+60.0	26.0	37				
38	31	39.1	+59.9	23.9	32	33.9	+59.9																										

27°, 333° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Dec.																					
0	6 14.0	+59.9	152.8	5 20.6	+60.0	152.9	4 27.2	+60.0	152.9	3 33.8	+60.0	152.9	2 40.4	+59.9	153.0	1 46.9	+60.0	153.0	0 53.5	+60.0	153.0	0 00.0	+60.0	153.0	0
1	7 13.9	+59.9	152.8	6 20.6	+59.9	152.8	5 27.2	+59.9	152.9	4 33.8	+59.9	152.9	3 40.3	+60.0	152.9	2 46.9	+60.0	153.0	1 53.5	+60.0	153.0	1 00.0	+60.0	153.0	1
2	8 13.8	+59.9	152.7	7 20.5	+59.9	152.8	6 27.1	+60.0	152.8	5 33.7	+60.0	152.9	4 40.3	+60.0	152.9	3 46.9	+60.0	153.0	2 53.5	+60.0	153.0	2 00.0	+60.0	153.0	2
3	9 13.7	+60.0	152.7	8 20.4	+60.0	152.7	7 27.1	+59.9	152.8	6 33.7	+60.0	152.8	5 40.3	+60.0	152.9	4 46.9	+60.0	152.9	3 53.5	+60.0	153.0	3 00.0	+60.0	153.0	3
4	10 13.7	+59.9	152.6	9 20.4	+59.9	152.7	8 27.0	+60.0	152.8	7 33.7	+60.0	152.8	6 40.3	+60.0	152.9	5 46.9	+60.0	152.9	4 53.5	+60.0	153.0	4 00.0	+60.0	153.0	4
5	11 13.6	+59.9	152.5	10 20.3	+59.9	152.6	9 27.0	+59.9	152.7	8 33.7	+59.9	152.8	7 40.3	+60.0	152.8	6 46.9	+60.0	152.9	5 53.5	+59.9	153.0	5 00.0	+60.0	153.0	5
6	12 13.5	+59.9	152.5	11 20.2	+60.0	152.6	10 26.9	+59.9	152.7	9 33.6	+60.0	152.8	8 40.3	+59.9	152.8	7 46.9	+60.0	152.9	6 53.4	+60.0	152.9	6 00.0	+60.0	153.0	6
7	13 13.4	+59.9	152.4	12 20.2	+59.9	152.5	11 26.9	+59.9	152.6	10 33.6	+60.0	152.7	9 40.2	+60.0	152.8	8 46.9	+60.0	152.9	7 53.4	+60.0	152.9	7 00.0	+60.0	153.0	7
8	14 13.3	+59.9	152.4	13 20.1	+59.9	152.5	12 26.8	+60.0	152.6	11 33.6	+59.9	152.7	10 40.2	+60.0	152.8	9 46.9	+59.9	152.9	8 53.4	+60.0	152.9	8 00.0	+60.0	153.0	8
9	15 13.2	+59.9	152.3	14 20.0	+59.9	152.4	13 26.8	+59.9	152.5	12 33.5	+60.0	152.7	11 40.2	+60.0	152.8	10 46.8	+60.0	152.8	9 53.4	+60.0	152.9	9 00.0	+60.0	153.0	9
10	16 13.1	+59.9	152.2	15 19.9	+60.0	152.4	14 26.7	+60.0	152.5	13 33.5	+60.0	152.6	12 40.2	+60.0	152.7	11 46.8	+60.0	152.8	10 53.4	+60.0	152.9	10 00.0	+60.0	153.0	10
11	17 13.0	+59.9	152.2	16 19.9	+59.9	152.3	15 26.7	+59.9	152.5	14 33.5	+59.9	152.6	13 40.2	+60.0	152.7	12 46.8	+60.0	152.8	11 53.4	+60.0	152.9	11 00.0	+60.0	153.0	11
12	18 12.9	+59.9	152.1	17 19.8	+59.9	152.3	16 26.6	+60.0	152.4	15 33.4	+60.0	152.6	14 40.2	+59.9	152.7	13 46.8	+60.0	152.8	12 53.4	+60.0	152.9	12 00.0	+60.0	153.0	12
13	19 12.8	+59.9	152.1	18 19.7	+59.9	152.2	17 26.6	+59.9	152.4	16 33.4	+60.0	152.5	15 40.1	+60.0	152.6	14 46.8	+60.0	152.8	13 53.4	+60.0	152.9	13 00.0	+60.0	153.0	13
14	20 12.7	+59.9	152.0	19 19.6	+60.0	152.2	18 26.5	+60.0	152.3	17 33.4	+59.9	152.5	16 40.1	+60.0	152.6	15 46.8	+60.0	152.8	14 53.4	+60.0	152.9	14 00.0	+60.0	153.0	14
15	21 12.6	+59.9	151.9	20 19.6	+59.9	152.1	19 26.5	+59.9	152.3	18 33.3	+60.0	152.4	17 40.1	+60.0	152.6	16 46.8	+60.0	152.7	15 53.4	+60.0	152.9	15 00.0	+60.0	153.0	15
16	22 12.5	+59.8	151.9	21 19.5	+59.9	152.1	20 26.4	+60.0	152.2	19 33.3	+60.0	152.4	18 40.1	+60.0	152.6	17 46.8	+60.0	152.7	16 53.4	+60.0	152.9	16 00.0	+60.0	153.0	16
17	23 12.3	+59.9	151.8	22 19.4	+59.9	152.0	21 26.4	+59.9	152.2	20 33.3	+59.9	152.4	19 40.1	+59.9	152.5	18 46.8	+60.0	152.7	17 53.4	+60.0	152.9	17 00.0	+60.0	153.0	17
18	24 12.2	+59.9	151.7	23 19.3	+60.0	152.0	22 26.3	+60.0	152.2	21 33.2	+60.0	152.3	20 40.0	+60.0	152.5	19 46.8	+60.0	152.7	18 53.4	+60.0	152.8	18 00.0	+60.0	153.0	18
19	25 12.1	+59.9	151.7	24 19.3	+59.9	151.9	23 26.3	+59.9	152.1	22 33.2	+60.0	152.3	21 40.0	+60.0	152.5	20 46.8	+60.0	152.7	19 53.4	+60.0	152.8	19 00.0	+60.0	153.0	19
20	26 12.0	+59.9	151.6	25 19.2	+59.9	151.8	24 26.2	+60.0	152.1	23 33.2	+59.9	152.3	22 40.0	+60.0	152.5	21 46.8	+59.9	152.7	20 53.4	+60.0	152.8	20 00.0	+60.0	153.0	20
21	27 11.9	+59.9	151.5	26 19.1	+59.9	151.8	25 26.2	+59.9	152.0	24 33.1	+60.0	152.2	23 40.0	+60.0	152.4	22 46.7	+60.0	152.6	21 53.4	+60.0	152.8	21 00.0	+60.0	153.0	21
22	28 11.8	+59.9	151.5	27 19.0	+59.9	151.7	26 26.1	+59.9	152.0	25 33.1	+60.0	152.2	24 40.0	+59.9	152.4	23 46.7	+60.0	152.6	22 53.4	+60.0	152.8	22 00.0	+60.0	153.0	22
23	29 11.7	+59.8	151.4	28 18.9	+59.9	151.7	27 26.0	+60.0	151.9	26 33.1	+59.9	152.1	25 39.9	+60.0	152.4	24 46.7	+60.0	152.6	23 53.4	+60.0	152.8	23 00.0	+60.0	153.0	23
24	30 11.5	+59.9	151.3	29 18.8	+59.9	151.6	28 26.0	+59.9	151.9	27 33.0	+60.0	152.1	26 39.9	+60.0	152.3	25 46.7	+60.0	152.6	24 53.4	+60.0	152.8	24 00.0	+60.0	153.0	24
25	31 11.4	+59.9	151.3	30 18.7	+59.9	151.5	29 25.9	+60.0	151.8	28 33.0	+59.9	152.1	27 39.9	+60.0	152.3	26 46.7	+60.0	152.6	25 53.4	+60.0	152.8	25 00.0	+60.0	153.0	25
26	32 11.3	+59.9	151.2	31 18.6	+60.0	151.5	30 25.9	+59.9	151.8	29 32.9	+60.0	152.0	28 39.9	+60.0	152.3	27 46.7	+60.0	152.5	26 53.4	+60.0	152.8	26 00.0	+60.0	153.0	26
27	33 11.2	+59.8	151.1	32 18.6	+59.9	151.4	31 25.8	+59.9	151.7	30 32.9	+60.0	152.0	29 39.9	+59.9	152.3	28 46.7	+60.0	152.5	27 53.4	+60.0	152.8	27 00.0	+60.0	153.0	27
28	34 11.0	+59.9	151.0	33 18.5	+59.9	151.3	32 25.7	+60.0	151.6	31 32.9	+59.9	151.9	30 39.8	+60.0	152.2	29 46.7	+60.0	152.5	28 53.4	+60.0	152.8	28 00.0	+60.0	153.0	28
29	35 10.9	+59.8	150.9	34 18.4	+59.9	151.3	33 25.7	+59.9	151.6	32 32.8	+60.0	151.9	31 39.8	+60.0	152.2	30 46.7	+60.0	152.5	29 53.4	+60.0	152.8	29 00.0	+60.0	153.0	29
30	36 10.7	+59.9	150.9	35 18.3	+59.9	151.2	34 25.6	+59.9	151.5	33 32.8	+59.9	151.9	32 39.8	+60.0	152.2	31 46.7	+60.0	152.5	30 53.4	+60.0	152.7	30 00.0	+60.0	153.0	30
31	37 10.6	+59.8	150.8	36 18.2	+59.8	151.1	35 25.5	+60.0	151.5	34 32.7	+60.0	151.8	33 39.8	+59.9	152.1	32 46.7	+59.9	152.4	31 53.4	+60.0	152.7	31 00.0	+60.0	153.0	31
32	38 10.5	+59.8	150.7	37 18.0	+59.9	151.1	36 25.5	+59.9	151.4	35 32.7	+59.9	151.8	34 39.7	+60.0	152.1	33 46.6	+60.0	152.4	32 53.4	+60.0	152.7	32 00.0	+60.0	153.0	32
33	39 10.3	+59.9	150.6	38 17.9	+59.9	151.0	37 25.4	+59.9	151.4	36 32.6	+60.0	151.7	35 39.7	+60.0	152.1	34 46.6	+60.0	152.4	33 53.4	+60.0	152.7	33 00.0	+60.0	153.0	33
34	40 10.2	+59.8	150.5	39 17.8	+59.9	150.9	38 23.5	+59.9	151.0	37 32.8	+59.9	151.5	36 40.3	+60.0	151.8	35 46.5	+60.0	152.1	34 53.4	+60.0	152.5	34 00.0	+60.0	153.0	34
35	41 10.0	+59.8	150.4	40 17.7	+59.9	150.8	39 25.2	+59.9	151.2	38 32.5	+60.0	151.6	37 39.7	+59.9	152.0	36 46.6	+60.0	152.3	35 53.4	+60.0	152.7	35 00.0	+60.0	153.0	35
36	42 09.8	+59.9	150.3	41 17.6	+59.9	150.7	40 25.1	+60.0	151.3	39 32.4	+60.0	151.7	38 39.6	+60.0	152.1	37 46.6	+60.0	152.3	36 53.4	+60.0					

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 27°, 333°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	6	14.0	-59.9	152.8	5	20.6	-59.9	152.9	4	27.2	-59.9	152.9	3	33.8	-60.0	152.9	2	40.4	-60.0	153.0	1	46.9	-60.0	153.0	0	53.5	-60.0	153.0	0	0.00	+60.0	27.0	0
1	5	14.1	-59.9	152.9	4	20.7	-59.9	152.9	3	27.3	-60.0	153.0	2	33.8	-59.9	153.0	1	40.4	-60.0	153.0	0	46.9	-60.0	153.0	0	0.65	+60.0	27.0	1				
2	4	14.2	-59.9	152.9	3	20.8	-60.0	153.0	2	27.3	-59.9	153.0	1	33.9	-60.0	153.0	0	40.4	-60.0	153.0	0	13.1	+60.0	27.0	2								
3	3	14.3	-59.9	153.0	2	20.8	-59.9	153.0	1	27.4	-60.0	153.0	0	33.9	-60.0	153.0	0	19.6	+60.0	27.0	1	13.1	+60.0	27.0	3								
4	2	14.4	-59.9	153.0	1	20.9	-59.9	153.1	0	27.4	-59.9	153.1	0	26.1	+59.9	26.9	1	19.6	+59.9	26.9	2	13.1	+59.9	27.0	4								
5	1	14.5	-59.9	153.1	0	21.0	-60.0	153.1	0	32.5	+60.0	26.9	1	26.0	+60.0	26.9	2	19.5	+60.0	26.9	3	13.0	+60.0	26.9	5								
6	0	14.6	-59.9	153.2	0	39.0	+59.9	26.8	1	32.5	+59.9	26.9	2	26.0	+60.0	26.9	3	19.5	+60.0	26.9	4	13.0	+60.0	26.9	6								
7	0	45.3	+59.9	26.8	1	38.9	+59.9	26.8	2	32.4	+60.0	26.8	3	26.0	+60.0	26.8	4	19.5	+60.0	26.9	5	13.0	+60.0	26.9	7								
8	1	45.2	+59.9	26.7	2	38.8	+59.9	26.7	3	32.4	+59.9	26.8	4	26.0	+59.9	26.8	5	19.5	+60.0	26.8	6	13.0	+60.0	26.9	8								
9	2	45.1	+59.9	26.7	3	38.7	+60.0	26.7	4	32.3	+60.0	26.7	5	25.9	+60.0	26.8	6	19.5	+60.0	26.8	7	13.0	+60.0	26.9	9								
10	3	45.0	+60.0	26.6	4	38.7	+59.9	26.7	5	32.3	+59.9	26.7	6	25.9	+60.0	26.7	7	19.5	+59.9	26.8	8	13.0	+60.0	26.9	10								
11	4	45.0	+59.9	26.6	5	38.6	+59.9	26.6	6	32.2	+60.0	26.7	7	25.9	+59.9	26.7	8	19.4	+60.0	26.8	9	13.0	+60.0	26.8	11								
12	5	44.9	+59.9	26.5	6	38.5	+60.0	26.6	7	32.2	+60.0	26.6	8	25.8	+60.0	26.7	9	19.4	+60.0	26.7	10	13.0	+60.0	26.8	12								
13	6	44.8	+59.9	26.5	7	38.5	+59.9	26.5	8	32.2	+59.9	26.6	9	25.8	+60.0	26.6	10	19.4	+60.0	26.7	11	13.0	+60.0	26.8	13								
14	7	44.7	+59.9	26.4	8	38.4	+59.9	26.5	9	32.1	+60.0	26.5	10	25.8	+59.9	26.6	11	19.4	+60.0	26.7	12	13.0	+60.0	26.8	14								
15	8	44.6	+59.9	26.3	9	38.3	+60.0	26.4	10	32.1	+59.9	26.5	11	25.7	+60.0	26.6	12	19.4	+60.0	26.7	13	13.0	+60.0	26.8	15								
16	9	44.5	+59.9	26.3	10	38.3	+59.9	26.4	11	32.0	+60.0	26.4	12	25.7	+60.0	26.5	13	19.4	+59.9	26.6	14	13.0	+60.0	26.8	16								
17	10	44.4	+59.9	26.2	11	38.2	+59.9	26.3	12	32.0	+59.9	26.4	13	25.7	+59.9	26.5	14	19.3	+60.0	26.6	15	13.0	+59.9	26.7	17								
18	11	44.3	+59.9	26.2	12	38.1	+60.0	26.3	13	31.9	+60.0	26.4	14	25.6	+60.0	26.5	15	19.3	+60.0	26.6	16	12.9	+60.0	26.7	18								
19	12	44.2	+59.9	26.1	13	38.1	+59.9	26.2	14	31.9	+59.9	26.3	15	25.6	+60.0	26.4	16	19.3	+60.0	26.6	17	12.9	+60.0	26.7	19								
20	13	44.1	+59.9	26.1	14	38.0	+59.9	26.2	15	31.8	+60.0	26.3	16	25.6	+59.9	26.4	17	19.3	+60.0	26.5	18	12.9	+60.0	26.7	20								
21	14	44.0	+59.9	26.0	15	37.9	+59.9	26.1	16	31.8	+59.9	26.2	17	25.5	+60.0	26.4	18	19.3	+59.9	26.5	19	12.9	+60.0	26.8	21								
22	15	43.9	+59.9	25.9	16	37.8	+60.0	26.1	17	31.7	+60.0	26.2	18	25.5	+60.0	26.3	19	19.2	+60.0	26.5	20	12.9	+60.0	26.7	22								
23	16	43.8	+59.9	25.9	17	37.8	+59.9	26.0	18	31.7	+59.9	26.2	19	25.5	+59.9	26.3	20	19.2	+60.0	26.5	21	12.9	+60.0	26.8	23								
24	17	43.7	+59.9	25.8	18	37.7	+59.9	26.0	19	31.6	+59.9	26.1	20	25.4	+60.0	26.3	21	19.2	+60.0	26.4	22	12.9	+60.0	26.6	24								
25	18	43.6	+59.9	25.8	19	37.6	+59.9	25.9	20	31.5	+60.0	26.1	21	25.4	+60.0	26.2	22	19.2	+60.0	26.4	23	12.9	+60.0	26.8	25								
26	19	43.5	+59.9	25.7	20	37.5	+60.0	25.8	21	31.5	+59.9	26.0	22	25.4	+59.9	26.2	23	19.2	+59.9	26.4	24	12.9	+60.0	26.8	26								
27	20	43.4	+59.9	25.6	21	37.5	+59.9	25.8	22	31.4	+60.0	26.0	23	25.3	+60.0	26.2	24	19.1	+60.0	26.4	25	12.9	+60.0	26.8	27								
28	21	43.3	+59.9	25.6	22	37.4	+59.9	25.7	23	31.4	+59.9	25.9	24	25.3	+60.0	26.1	25	19.1	+60.0	26.3	26	12.9	+60.0	26.8	28								
29	22	43.2	+59.9	25.5	23	37.3	+59.9	25.7	24	31.3	+60.0	25.9	25	25.3	+59.9	26.1	26	19.1	+60.0	26.3	27	12.8	+60.0	26.6	29								
30	23	43.1	+59.9	25.4	24	37.2	+59.9	25.6	25	31.3	+59.9	25.8	26	25.2	+60.0	26.0	27	19.1	+60.0	26.3	28	12.8	+60.0	26.5	30								
31	24	43.0	+59.9	25.4	25	37.1	+60.0	25.6	26	31.2	+60.0	25.8	27	25.2	+60.0	26.0	28	19.1	+59.9	26.2	29	12.8	+60.0	26.7	31								
32	25	42.9	+59.8	25.3	26	37.1	+59.9	25.5	27	31.2	+59.9	25.7	28	25.2	+59.9	26.0	29	19.0	+60.0	26.2	30	12.8	+60.0	26.6	32								
33	26	42.7	+59.9	25.2	27	37.0	+59.9	25.4	28	31.1	+59.9	25.7	29	25.1	+60.0	25.9	30	19.0	+60.0	26.2	31	12.8	+60.0	26.7	33								
34	27	42.6	+59.9	25.2	28	36.9	+59.9	25.4	29	31.0	+60.0	25.6	30	25.1	+59.9	25.9	31	19.0	+60.0	26.1	32	12.8	+60.0	26.6	34								
35	28	42.5	+59.9	25.1	29	36.8	+59.9	25.3	30	31.0	+59.9	25.6	31	25.0	+60.0	26.0	32	19.0	+60.0	26.1	33	12.8	+60.0	26.6	35								
36	29	42.4	+59.9	25.0	30	36.7	+59.9	25.3	31	30.9	+59.9	25.5	32	25.0	+59.9	25.8	33	19.0	+59.9	26.1	34	12.8	+60.0	26.6	36								
37	30	42.3	+59.8	24.9	31	36.6	+59.9	25.2	32	30.8	+60.0	25.5	33	24.9	+59.9	25.7	34	18.9	+60.0	26.0	35	12.8	+60.0	26.7	37								
38	31	42.1	+59.9	24.9	32	36.5	+59.9	25.1	33	30.8	+59.9	25.4	34	24.9	+60.0	25.7	35	18.9	+60.0	26.0	36	12.8	+60.0	26.6	38								
39	32	42.0	+59.9	24.8	33	36.4	+59.9	25.1	34	30.7	+59.9	25.4	35	24.9	+59.9	25.7	36	18.9	+59.9	26.0	37	12.7	+60.0	26.3	39								
40	33	41.9	+59.8	24.7	34	36.3	+59.9	25.0	35	30.6	+60.0	25.3	36	24.8	+60.0	25.6	37	18.8	+60.0	25.9	38	12.7	+60.0	26.3	40								
41	34	41.7	+59.9	24.6	35	36.2	+59.9	24.9	36	30.6	+59.9	25.2	37	24.8	+59.9	25.6	38	18.8	+60.0	25.9	39	12.7	+60.0	26.6	41								
42	35	41.6	+59.9	24.5	36	36.1	+59.9	24.9	37	30.5	+59.9	25.2	38	24.7	+60.0	25.5	39	18.8	+60.0	25.9	40	12.7	+60.0	26.6	42								

28°, 332° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Dec.																					
0	6 10.6	+59.9	151.8	5 17.7	+60.0	151.9	4 24.8	+60.0	151.9	3 31.9	+59.9	151.9	2 38.9	+60.0	152.0	1 45.9	+60.0	152.0	0 53.0	+60.0	152.0	0 00.0	+60.0	152.0	0
1	7 10.5	+59.9	151.8	6 17.7	+59.9	151.8	5 24.8	+59.9	151.9	4 31.8	+60.0	151.9	3 38.9	+60.0	151.9	2 45.9	+60.0	152.0	1 53.0	+60.0	152.0	1 00.0	+60.0	152.0	1
2	8 10.4	+59.9	151.7	7 17.6	+59.9	151.8	6 24.7	+60.0	151.8	5 31.8	+60.0	151.9	4 38.9	+60.0	151.9	3 45.9	+60.0	152.0	2 53.0	+60.0	152.0	2 00.0	+60.0	152.0	2
3	9 10.3	+59.9	151.6	8 17.5	+59.9	151.7	7 24.7	+59.9	151.8	6 31.8	+59.9	151.8	5 38.9	+59.9	151.9	4 45.9	+60.0	151.9	3 53.0	+60.0	152.0	3 00.0	+60.0	152.0	3
4	10 10.2	+59.9	151.6	9 17.4	+60.0	151.7	8 24.6	+60.0	151.7	7 31.7	+60.0	151.8	6 38.8	+60.0	151.9	5 45.9	+60.0	151.9	4 53.0	+60.0	152.0	4 00.0	+60.0	152.0	4
5	11 10.1	+59.9	151.5	10 17.4	+59.9	151.6	9 24.6	+59.9	151.7	8 31.7	+60.0	151.8	7 38.8	+60.0	151.8	6 45.9	+60.0	151.9	5 53.0	+60.0	152.0	5 00.0	+60.0	152.0	5
6	12 10.0	+59.9	151.5	11 17.3	+59.9	151.6	10 24.5	+60.0	151.7	9 31.7	+59.9	151.7	8 38.8	+60.0	151.8	7 45.9	+60.0	151.9	6 53.0	+60.0	151.9	6 00.0	+60.0	152.0	6
7	13 09.9	+59.9	151.4	12 17.2	+59.9	151.5	11 24.5	+59.9	151.6	10 31.6	+60.0	151.7	9 38.8	+60.0	151.8	8 45.9	+60.0	151.9	7 53.0	+60.0	151.9	7 00.0	+60.0	152.0	7
8	14 09.8	+59.9	151.3	13 17.1	+60.0	151.5	12 24.4	+59.9	151.6	11 31.6	+60.0	151.7	10 38.8	+59.9	151.8	9 45.9	+60.0	151.9	8 53.0	+60.0	151.9	8 00.0	+60.0	152.0	8
9	15 09.7	+59.9	151.3	14 17.1	+59.9	151.4	13 24.3	+60.0	151.5	12 31.6	+59.9	151.6	11 38.7	+60.0	151.7	10 45.9	+60.0	151.8	9 53.0	+60.0	151.9	9 00.0	+60.0	152.0	9
10	16 09.6	+59.9	151.2	15 17.0	+59.9	151.4	14 24.3	+59.9	151.5	13 31.5	+60.0	151.6	12 38.7	+60.0	151.7	11 45.9	+60.0	151.8	10 53.0	+60.0	151.9	10 00.0	+60.0	152.0	10
11	17 09.5	+59.9	151.2	16 16.9	+59.9	151.3	15 24.2	+60.0	151.4	14 31.5	+60.0	151.6	13 38.7	+60.0	151.7	12 45.9	+60.0	151.8	11 53.0	+60.0	151.9	11 00.0	+60.0	152.0	11
12	18 09.4	+59.9	151.1	17 16.8	+59.9	151.3	16 24.2	+59.9	151.4	15 31.5	+59.9	151.5	14 38.7	+60.0	151.7	13 45.9	+59.9	151.8	12 53.0	+59.9	151.9	12 00.0	+60.0	152.0	12
13	19 09.3	+59.9	151.0	18 16.7	+60.0	151.2	17 24.1	+60.0	151.4	16 31.4	+60.0	151.5	15 38.7	+60.0	151.6	14 45.8	+60.0	151.8	13 52.9	+60.0	151.9	13 00.0	+60.0	152.0	13
14	20 09.2	+59.9	151.0	19 16.7	+59.9	151.1	18 24.1	+59.9	151.3	17 31.4	+60.0	151.5	16 38.7	+60.0	151.7	15 45.8	+60.0	151.9	14 52.9	+60.0	151.9	14 00.0	+60.0	152.0	14
15	21 09.1	+59.8	150.9	20 16.6	+59.9	151.1	19 24.0	+60.0	151.3	18 31.4	+59.9	151.4	17 38.6	+60.0	151.6	16 45.8	+60.0	151.7	15 52.9	+60.0	151.9	15 00.0	+60.0	152.0	15
16	22 08.9	+59.9	150.8	21 16.5	+59.9	151.0	20 24.0	+59.9	151.2	19 31.3	+60.0	151.4	18 38.6	+60.0	151.6	17 45.8	+60.0	151.7	16 52.9	+60.0	151.9	16 00.0	+60.0	152.0	16
17	23 08.8	+59.9	150.8	22 16.4	+59.9	151.0	21 23.9	+59.9	151.2	20 31.3	+60.0	151.4	19 38.6	+60.0	151.5	18 45.8	+60.0	151.7	17 52.9	+60.0	151.9	17 00.0	+60.0	152.0	17
18	24 08.7	+59.9	150.7	23 16.3	+59.9	150.9	22 23.8	+60.0	151.1	21 31.3	+59.9	151.3	20 38.6	+60.0	151.5	19 45.8	+60.0	151.7	18 52.9	+60.0	151.8	18 00.0	+60.0	152.0	18
19	25 08.6	+59.9	150.6	24 16.2	+60.0	150.9	23 23.8	+59.9	151.1	22 31.2	+60.0	151.3	21 38.6	+59.9	151.5	20 45.8	+60.0	151.7	19 52.9	+60.0	151.8	19 00.0	+60.0	152.0	19
20	26 08.5	+59.9	150.6	25 16.2	+59.9	150.8	24 23.7	+60.0	151.0	23 31.2	+59.9	151.2	22 38.5	+60.0	151.4	21 45.8	+60.0	151.6	20 52.9	+60.0	151.8	20 00.0	+60.0	152.0	20
21	27 08.4	+59.8	150.5	26 16.1	+59.9	150.7	25 23.7	+59.9	151.0	24 31.1	+60.0	151.2	23 38.5	+60.0	151.4	22 45.8	+60.0	151.6	21 52.9	+60.0	151.8	21 00.0	+60.0	152.0	21
22	28 08.2	+59.9	150.4	27 16.0	+59.9	150.7	26 23.6	+59.9	150.9	25 31.1	+60.0	151.2	24 38.5	+60.0	151.4	23 45.8	+60.0	151.6	22 52.9	+60.0	151.8	22 00.0	+60.0	152.0	22
23	29 08.1	+59.9	150.3	28 15.9	+59.9	150.6	27 23.5	+60.0	150.9	26 31.1	+59.9	151.1	25 38.5	+59.9	151.4	24 45.8	+59.9	151.6	23 52.9	+60.0	151.8	23 00.0	+60.0	152.0	23
24	30 08.0	+59.8	150.3	29 15.8	+59.9	150.6	28 23.5	+59.9	150.8	27 31.0	+60.0	151.1	26 38.4	+60.0	151.3	25 45.7	+60.0	151.6	24 52.9	+60.0	151.8	24 00.0	+60.0	152.0	24
25	31 07.8	+59.9	150.2	30 15.7	+59.9	150.5	29 23.4	+59.9	150.8	28 31.0	+59.9	151.0	27 38.4	+60.0	151.3	26 45.7	+60.0	151.5	25 52.9	+60.0	151.8	25 00.0	+60.0	152.0	25
26	32 07.7	+59.9	150.1	31 15.6	+59.9	150.4	30 23.3	+59.9	150.7	29 30.9	+60.0	151.0	28 38.4	+60.0	151.3	27 45.7	+60.0	151.5	26 52.9	+60.0	151.8	26 00.0	+60.0	152.0	26
27	33 07.6	+59.8	150.0	32 15.5	+59.9	150.4	31 23.3	+59.9	150.7	30 30.9	+60.0	151.0	29 38.4	+59.9	151.2	28 45.7	+60.0	151.5	27 52.9	+60.0	151.8	27 00.0	+60.0	152.0	27
28	34 07.4	+59.8	150.0	33 15.4	+59.9	150.3	32 23.2	+59.9	150.6	31 30.9	+59.9	150.9	30 38.3	+60.0	151.2	29 45.7	+60.0	151.5	28 52.9	+60.0	151.8	28 00.0	+60.0	152.0	28
29	35 07.3	+59.8	149.9	34 15.3	+59.9	150.2	33 23.1	+60.0	150.5	32 30.8	+60.0	150.9	31 38.3	+60.0	151.2	30 45.7	+60.0	151.5	29 52.9	+60.0	151.8	29 00.0	+60.0	152.0	29
30	36 07.1	+59.8	149.8	35 15.2	+59.9	150.1	34 23.1	+59.9	150.5	33 30.8	+59.9	150.8	32 38.3	+60.0	151.1	31 45.7	+60.0	151.4	30 52.9	+60.0	151.7	30 00.0	+60.0	152.0	30
31	37 07.0	+59.8	149.7	36 15.1	+59.9	150.1	35 23.0	+59.9	150.4	34 30.7	+60.0	150.8	33 38.3	+59.9	151.1	32 45.7	+60.0	151.4	31 52.9	+60.0	151.7	31 00.0	+60.0	152.0	31
32	38 06.8	+59.8	149.6	37 15.0	+59.8	150.0	36 22.9	+59.9	150.4	35 30.7	+59.9	150.7	34 38.2	+60.0	151.1	33 45.7	+59.9	151.4	32 52.9	+60.0	151.7	32 00.0	+60.0	152.0	32
33	39 06.7	+59.8	149.5	38 14.8	+59.9	149.9	37 22.8	+59.9	150.3	36 30.6	+60.0	150.7	35 38.2	+60.0	151.0	34 45.6	+60.0	151.4	33 52.9	+60.0	151.7	33 00.0	+60.0	152.0	33
34	40 06.5	+59.8	149.4	39 14.7	+59.9	149.8	38 22.7	+59.9	149.7	37 29.9	+59.9	149.4	36 38.0	+60.0	150.5	35 45.6	+60.0	151.3	34 52.9	+60.0	151.7	34 00.0	+60.0	152.0	34
35	41 06.3	+59.8	149.3	40 14.6	+59.9	149.7	39 22.7	+59.9	150.2	38 30.5	+60.0	150.6	37 38.2	+59.9	150.9	36 45.6	+60.0	151.3	35 52.9	+60.0	151.7	35 00.0	+60.0	152.0	35
36	42 06.1	+59.8	149.2	41 14.5	+59.8	149.7	40 22.6	+59.9	150.1	39 30.5	+59.9	150.5	38 38.1	+60.0	150.9	37 45.6	+60.0	151.3	36 52.9	+60.0					

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 28° , 332°

Dec.	83°			84°			85°			86°			87°			88°			89°			Dec.											
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	6	10.6	-59.9	151.8	5	17.7	-59.9	151.9	4	24.8	-59.9	151.9	3	31.9	-60.0	151.9	2	38.9	-60.0	152.0	1	45.9	-59.9	152.0	0	53.0	-60.0	152.0	0	0.00	+60.0	28.0	0
1	5	10.7	-59.9	151.9	4	17.8	-59.9	151.9	3	24.9	-60.0	152.0	2	31.9	-60.0	152.0	1	38.9	-59.9	152.0	0	46.0	-60.0	152.0	0	07.0	+60.0	28.0	1				
2	4	10.8	-59.9	151.9	3	17.9	-59.9	152.0	2	24.9	-59.9	152.0	1	31.9	-59.9	152.0	0	39.0	-60.0	152.0	0	14.0	+60.0	28.0	2								
3	3	10.9	-59.9	152.0	2	18.0	-60.0	152.0	1	25.0	-60.0	152.0	0	32.0	-60.0	152.0	0	21.0	+60.0	28.0	2												
4	2	11.0	-59.9	152.1	1	18.0	-59.9	152.1	0	25.0	-59.9	152.1	0	28.0	+60.0	27.9	1	21.0	+60.0	27.9	2	14.0	+60.0	28.0	3								
5	1	11.1	-59.9	152.1	0	18.1	-59.9	152.1	0	34.9	+60.0	27.8	1	28.0	+59.9	27.8	2	21.0	+60.0	27.9	3	14.0	+60.0	28.0	4								
6	0	11.2	-59.9	152.2	0	41.8	+60.0	27.8	1	34.9	+59.9	27.8	2	27.9	+60.0	27.9	3	21.0	+60.0	27.9	4	14.0	+60.0	28.0	5								
7	0	48.7	+59.9	27.8	1	41.8	+59.9	27.8	2	34.8	+60.0	27.8	3	27.9	+60.0	27.8	4	21.0	+59.9	27.9	5	14.0	+60.0	27.9	6								
8	1	48.6	+59.9	27.7	2	41.7	+59.9	27.7	3	34.8	+59.9	27.8	4	27.9	+59.9	27.8	5	20.9	+60.0	27.8	6	14.0	+60.0	27.9	7								
9	2	48.5	+59.9	27.7	3	41.6	+59.9	27.7	4	34.7	+60.0	27.7	5	27.8	+60.0	27.8	6	20.9	+60.0	27.8	7	14.0	+60.0	27.9	8								
10	3	48.4	+59.9	27.6	4	41.5	+60.0	27.6	5	34.7	+59.9	27.7	6	27.8	+60.0	27.7	7	20.9	+60.0	27.8	8	14.0	+60.0	27.8	9								
11	4	48.3	+59.9	27.5	5	41.5	+59.9	27.6	6	34.6	+60.0	27.6	7	27.8	+59.9	27.7	8	20.9	+60.0	27.8	9	14.0	+60.0	27.9	10								
12	5	48.2	+59.9	27.5	6	41.4	+59.9	27.5	7	34.6	+59.9	27.6	8	27.7	+60.0	27.7	9	20.9	+59.9	27.7	10	14.0	+60.0	27.8	11								
13	6	48.1	+59.9	27.4	7	41.3	+59.9	27.5	8	34.5	+60.0	27.6	9	27.7	+60.0	27.6	10	20.8	+60.0	27.7	11	13.9	+60.0	27.8	12								
14	7	48.0	+59.9	27.4	8	41.2	+60.0	27.4	9	34.5	+59.9	27.5	10	27.7	+59.9	27.6	11	20.8	+60.0	27.7	12	13.9	+60.0	27.8	13								
15	8	47.9	+59.9	27.3	9	41.2	+59.9	27.4	10	34.4	+60.0	27.5	11	27.6	+60.0	27.6	12	20.8	+60.0	27.7	13	13.9	+60.0	27.8	14								
16	9	47.8	+59.9	27.3	10	41.1	+59.9	27.3	11	34.4	+59.9	27.4	12	27.6	+60.0	27.5	13	20.8	+60.0	27.6	14	13.9	+60.0	27.7	15								
17	10	47.7	+59.9	27.2	11	41.0	+59.9	27.3	12	34.3	+60.0	27.4	13	27.6	+59.9	27.5	14	20.8	+60.0	27.6	15	13.9	+60.0	27.7	16								
18	11	47.6	+59.9	27.1	12	40.9	+60.0	27.2	13	34.3	+59.9	27.3	14	27.5	+60.0	27.5	15	20.8	+59.9	27.6	16	13.9	+60.0	27.7	17								
19	12	47.5	+59.9	27.1	13	40.9	+59.9	27.2	14	34.2	+60.0	27.3	15	27.5	+60.0	27.4	16	20.7	+60.0	27.6	17	13.9	+60.0	27.8	18								
20	13	47.4	+59.9	27.0	14	40.8	+59.9	27.1	15	34.2	+59.9	27.3	16	27.5	+59.9	27.4	17	20.7	+60.0	27.5	18	13.9	+60.0	27.7	19								
21	14	47.3	+59.9	27.0	15	40.7	+59.9	27.1	16	34.1	+60.0	27.2	17	27.4	+60.0	27.4	18	20.7	+60.0	27.5	19	13.9	+60.0	27.7	20								
22	15	47.2	+59.9	26.9	16	40.6	+60.0	27.0	17	34.1	+59.9	27.2	18	27.4	+60.0	27.3	19	20.7	+60.0	27.6	20	13.9	+60.0	27.8	21								
23	16	47.1	+59.8	26.8	17	40.6	+59.9	27.0	18	34.0	+59.9	27.1	19	27.4	+59.9	27.3	20	20.7	+59.9	27.4	21	13.9	+59.9	27.6	22								
24	17	46.9	+59.9	26.8	18	40.5	+59.9	26.9	19	33.9	+60.0	27.1	20	27.3	+60.0	27.2	21	20.6	+60.0	27.4	22	13.8	+60.0	27.8	23								
25	18	46.8	+59.9	26.7	19	40.4	+59.9	26.9	20	33.9	+59.9	27.0	21	27.3	+60.0	27.2	22	20.6	+60.0	27.4	23	13.8	+60.0	27.8	24								
26	19	46.7	+59.9	26.6	20	40.3	+59.9	26.8	21	33.8	+60.0	27.0	22	27.3	+59.9	27.2	23	20.6	+60.0	27.4	24	13.8	+60.0	27.8	25								
27	20	46.6	+59.9	26.6	21	40.2	+60.0	26.8	22	33.8	+59.9	26.9	23	27.2	+60.0	27.1	24	20.6	+59.9	27.3	25	13.8	+60.0	27.8	26								
28	21	46.5	+59.9	26.5	22	40.2	+59.9	26.7	23	33.7	+60.0	26.9	24	27.2	+59.9	27.1	25	20.5	+60.0	27.3	26	13.8	+60.0	27.8	27								
29	22	46.4	+59.9	26.4	23	40.1	+59.9	26.6	24	33.7	+59.9	26.8	25	27.1	+60.0	27.0	26	20.5	+60.0	27.3	27	13.8	+60.0	27.8	29								
30	23	46.3	+59.9	26.4	24	40.0	+59.9	26.6	25	33.6	+59.9	26.8	26	27.1	+60.0	27.0	27	20.5	+60.0	27.2	28	13.8	+60.0	27.8	30								
31	24	46.2	+59.8	26.3	25	39.9	+59.9	26.5	26	33.5	+60.0	26.7	27	27.1	+59.9	27.0	28	20.5	+60.0	27.2	29	13.8	+60.0	27.8	31								
32	25	46.0	+59.9	26.2	26	39.8	+59.9	26.5	27	33.5	+59.9	26.7	28	27.0	+60.0	26.9	29	20.5	+59.9	27.2	30	13.8	+60.0	28.0	32								
33	26	45.9	+59.9	26.2	27	39.7	+59.9	26.4	28	33.4	+59.9	26.6	29	27.0	+59.9	26.9	30	20.4	+60.0	27.1	31	13.8	+59.9	27.7	33								
34	27	45.8	+59.9	26.1	28	39.6	+59.9	26.3	29	33.3	+60.0	26.6	30	26.9	+60.0	26.8	31	20.4	+60.0	27.1	32	13.7	+60.0	27.8	34								
35	28	45.7	+59.8	26.0	29	39.5	+59.9	26.3	30	33.3	+59.9	26.5	31	26.9	+59.9	26.8	32	20.4	+60.0	27.1	33	13.7	+60.0	27.8	35								
36	29	45.5	+59.9	25.9	30	39.4	+59.9	26.2	31	33.2	+59.9	26.5	32	26.8	+60.0	26.7	33	20.4	+59.9	27.0	34	13.7	+60.0	27.8	36								
37	30	45.4	+59.9	25.9	31	39.3	+59.9	26.1	32	33.1	+60.0	26.4	33	26.8	+60.0	26.3	34	20.3	+60.0	27.1	35	13.7	+60.0	27.8	37								
38	31	45.3	+59.8	25.8	32	39.2	+59.9	26.1	33	33.1	+59.9	26.4	34	26.8	+59.9	26.7	35	20.3	+60.0	27.0	36	13.7	+60.0	27.8	38								
39	32	45.1	+59.8	25.7	33	39.1	+59.9	26.0	34	33.0	+59.9	26.3	35	26.7	+60.0	26.6	36	20.3	+59.9	26.9	37	13.7	+60.0	27.8	39								
40	33	45.0	+59.8	25.6	34	39.0	+59.9	25.9	35	32.9	+59.9	26.2	36	26.7	+60.0	26.9	37	20.2	+60.0	27.2	38	13.7	+60.0	27.8	40								
41	34	44.8	+59.9	25.5	35	38.9	+59.9	25.9	36	32.8	+60.0	26.0	37	26.6	+60.0	26.5	38	20.2	+60.0	27.3	39	13.7	+60.0	27.8	41								
42	35	44.7	+59.8	25.5	36	38.8	+59.9	25.8	37	32.8	+59.9	26.1	38	26.6	+59.9	26.5	39	20.2	+60.0	27.0	40	13.6	+60.0	27.6	42								
43	36	44.5	+59.9	25.4	37	38.7	+59.9	25.7	38	32.7	+59.9	26.0	39	26.5	+59.9	26.4	40	20.2	+59.9	26.8	41	13.6	+60.0	27.6	43								

29°, 331° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.		
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.		
0	6 07.1 +59.9 150.8	5 14.7 +59.9 150.9	4 22.3 +60.0 150.9	3 29.9 +59.9 150.9	2 37.4 +60.0 151.0	1 44.9 +60.0 151.0	0 52.5 +60.0 151.0	0 00.0 +60.0 151.0	0	11 06.6 +59.9 150.5	10 14.3 +60.0 150.6	9 22.0 +60.0 150.7	8 29.7 +60.0 150.8	7 37.3 +60.0 150.8	6 44.9 +60.0 150.9	5 52.5 +60.0 151.0	5 00.0 +60.0 151.0	5	12 06.5 +59.9 150.5	11 14.3 +59.9 150.6	10 22.0 +59.9 150.6	9 29.7 +59.9 150.7	8 37.3 +60.0 150.7	7 44.9 +60.0 150.9	6 52.5 +60.0 150.9	6 00.0 +60.0 151.0	6
1	7 07.0 +59.9 150.8	6 14.6 +60.0 150.8	5 22.3 +59.9 150.9	4 29.8 +60.0 150.9	3 37.4 +60.0 150.9	2 44.9 +60.0 151.0	1 52.5 +60.0 151.0	1 00.0 +60.0 151.0	1	8 06.9 +59.9 150.7	7 14.6 +59.9 150.8	6 22.2 +59.9 150.8	5 29.8 +60.0 150.9	4 37.4 +60.0 150.9	3 44.9 +60.0 151.0	2 52.5 +60.0 151.0	2 00.0 +60.0 151.0	2									
2	9 06.8 +59.9 150.6	8 14.5 +59.9 150.7	7 22.1 +60.0 150.8	6 29.8 +59.9 150.8	5 37.4 +59.9 150.9	4 44.9 +60.0 150.9	3 52.5 +60.0 151.0	3 00.0 +60.0 151.0	3	10 06.7 +59.9 150.6	9 14.4 +59.9 150.7	8 22.1 +59.9 150.7	7 29.7 +60.0 150.8	6 37.3 +60.0 150.9	5 44.9 +60.0 150.9	4 52.5 +60.0 151.0	4 00.0 +60.0 151.0	4									
3	11 06.6 +59.9 150.5	10 14.3 +60.0 150.6	9 22.0 +60.0 150.7	8 29.7 +60.0 150.8	7 37.3 +60.0 150.8	6 44.9 +60.0 150.9	5 52.5 +60.0 151.0	5 00.0 +60.0 151.0	5																		
4	12 06.5 +59.9 150.5	11 14.3 +59.9 150.6	10 22.0 +59.9 150.6	9 29.7 +59.9 150.7	8 37.3 +60.0 150.8	7 44.9 +60.0 150.9	6 52.5 +60.0 150.9	6 00.0 +60.0 151.0	6																		
5	13 06.4 +59.9 150.4	12 14.2 +59.9 150.5	11 21.9 +60.0 150.6	10 29.6 +60.0 150.7	9 37.3 +60.0 150.8	8 44.9 +60.0 150.9	7 52.5 +60.0 150.9	7 00.0 +60.0 151.0	7																		
6	14 06.3 +59.8 150.3	13 14.1 +59.9 150.4	12 21.9 +59.9 150.5	11 29.6 +60.0 150.7	10 37.3 +59.9 150.8	9 44.9 +60.0 150.8	8 52.5 +60.0 150.9	8 00.0 +60.0 151.0	8																		
7	15 06.1 +59.8 150.3	14 14.0 +59.9 150.4	13 21.8 +60.0 150.5	12 29.6 +59.9 150.6	11 37.2 +60.0 150.7	10 44.9 +60.0 150.8	9 52.5 +60.0 150.9	9 00.0 +60.0 151.0	9																		
8	16 06.0 +59.8 150.2	15 13.9 +59.9 150.3	14 21.8 +59.9 150.5	13 29.5 +60.0 150.6	12 37.2 +60.0 150.7	11 44.9 +60.0 150.8	10 52.5 +60.0 150.9	10 00.0 +60.0 151.0	10																		
9	17 05.9 +59.9 150.1	16 13.8 +60.0 150.3	15 21.7 +59.9 150.4	14 29.5 +59.9 150.6	13 37.2 +60.0 150.7	12 44.9 +59.9 150.8	11 52.5 +60.0 150.9	11 00.0 +60.0 151.0	11																		
10	18 05.8 +59.9 150.1	17 13.8 +59.9 150.2	16 21.6 +60.0 150.4	15 29.4 +60.0 150.5	14 37.2 +60.0 150.7	13 44.8 +60.0 150.8	12 52.5 +59.9 150.9	12 00.0 +60.0 151.0	12																		
11	19 05.7 +59.8 150.0	18 13.7 +59.9 150.2	17 21.6 +59.9 150.3	16 29.4 +60.0 150.5	15 37.2 +59.9 150.6	14 44.8 +60.0 150.8	13 52.4 +60.0 150.9	13 00.0 +60.0 151.0	13																		
12	20 05.6 +59.8 149.9	19 13.6 +59.9 150.1	18 21.5 +60.0 150.3	17 29.4 +59.9 150.4	16 37.1 +60.0 150.6	15 44.8 +60.0 150.7	14 52.4 +60.0 150.9	14 00.0 +60.0 151.0	14																		
13	21 05.4 +59.9 149.9	20 13.5 +59.9 150.1	19 21.5 +59.9 150.2	18 29.3 +60.0 150.4	17 37.1 +60.0 150.6	16 44.8 +60.0 150.7	15 52.4 +60.0 150.9	15 00.0 +60.0 151.0	15																		
14	22 05.3 +59.8 149.8	21 13.4 +59.9 150.0	20 21.4 +59.9 150.2	19 29.3 +60.0 150.4	18 37.1 +60.0 150.5	17 44.8 +60.0 150.7	16 52.4 +60.0 150.9	16 00.0 +60.0 151.0	16																		
15	23 05.2 +59.9 149.7	22 13.3 +59.9 149.9	21 21.3 +60.0 150.1	20 29.3 +59.9 150.3	19 37.1 +59.9 150.5	18 44.8 +60.0 150.7	17 52.4 +60.0 150.8	17 00.0 +60.0 151.0	17																		
16	24 05.1 +59.9 149.7	23 13.2 +59.9 149.9	22 21.3 +59.9 150.1	21 29.2 +60.0 150.3	20 37.0 +60.0 150.5	19 44.8 +60.0 150.7	18 52.4 +60.0 150.8	18 00.0 +60.0 151.0	18																		
17	25 05.0 +59.8 149.6	24 13.1 +60.0 149.8	23 21.2 +60.0 150.0	22 29.2 +59.9 150.3	21 37.0 +60.0 150.5	20 44.8 +60.0 150.7	19 52.4 +60.0 150.8	19 00.0 +60.0 151.0	19																		
18	26 04.8 +59.9 149.5	25 13.1 +59.9 149.7	24 21.2 +59.9 150.0	23 29.1 +60.0 150.2	22 37.0 +60.0 150.4	21 44.8 +60.0 150.6	20 52.4 +60.0 150.8	20 00.0 +60.0 151.0	20																		
19	27 04.7 +59.9 149.4	26 13.0 +59.9 149.7	25 21.1 +59.9 149.9	24 29.1 +60.0 150.2	23 37.0 +60.0 150.4	22 44.8 +60.0 150.6	21 52.4 +60.0 150.8	21 00.0 +60.0 151.0	21																		
20	28 04.6 +59.8 149.4	27 12.9 +59.9 149.6	26 21.0 +60.0 149.9	25 29.1 +59.9 150.1	24 37.0 +59.9 150.4	23 44.7 +60.0 150.6	22 52.4 +60.0 150.8	22 00.0 +60.0 151.0	22																		
21	29 04.4 +59.8 149.3	28 12.8 +59.9 149.6	27 21.0 +59.9 149.8	26 29.0 +60.0 150.1	25 36.9 +60.0 150.3	24 44.7 +60.0 150.6	23 52.4 +60.0 150.8	23 00.0 +60.0 151.0	23																		
22	30 04.3 +59.8 149.2	29 12.7 +59.9 149.5	28 20.9 +59.9 149.8	27 29.0 +59.9 150.1	26 36.9 +60.0 150.3	25 44.7 +60.0 150.5	24 52.4 +60.0 150.8	24 00.0 +60.0 151.0	24																		
23	31 04.1 +59.8 149.1	30 12.6 +59.9 149.4	29 20.8 +59.9 149.7	28 28.9 +60.0 150.0	27 36.9 +60.0 150.3	26 44.7 +60.0 150.5	25 52.4 +60.0 150.8	25 00.0 +60.0 151.0	25																		
24	32 04.0 +59.8 149.1	31 12.5 +59.8 149.4	30 20.7 +60.0 149.7	29 28.9 +59.9 150.0	28 36.9 +59.9 150.2	27 44.7 +60.0 150.5	26 52.4 +60.0 150.8	26 00.0 +60.0 151.0	26																		
25	33 03.9 +59.8 149.0	32 12.3 +59.9 149.3	31 20.7 +59.9 149.6	30 28.8 +60.0 149.9	29 36.8 +60.0 150.2	28 44.7 +60.0 150.5	27 52.4 +60.0 150.7	27 00.0 +60.0 151.0	27																		
26	34 03.7 +59.8 148.9	33 12.2 +59.9 149.2	32 20.6 +59.9 149.6	31 28.8 +59.9 149.9	30 36.8 +60.0 150.2	29 44.7 +60.0 150.5	28 52.4 +60.0 150.7	28 00.0 +60.0 151.0	28																		
27	35 03.5 +59.8 148.8	34 12.1 +59.9 149.2	33 20.5 +59.9 149.5	32 28.7 +60.0 149.8	31 36.8 +60.0 150.1	30 44.7 +60.0 150.4	29 52.4 +60.0 150.7	29 00.0 +60.0 151.0	29																		
28	36 03.4 +59.8 148.7	35 12.0 +59.9 149.1	34 20.4 +60.0 149.4	33 28.7 +59.9 149.8	32 36.8 +60.0 150.3	31 44.7 +59.9 150.4	30 52.4 +60.0 150.7	30 00.0 +60.0 151.0	30																		
29	37 03.2 +59.8 148.6	36 11.9 +59.9 149.0	35 20.4 +59.9 149.4	34 28.6 +60.0 149.7	33 36.7 +60.0 150.1	32 44.6 +60.0 150.4	31 52.4 +60.0 150.7	31 00.0 +60.0 151.0	31																		
30	38 03.1 +59.8 148.5	37 11.8 +59.9 148.9	36 20.3 +59.9 149.3	35 28.6 +59.9 149.7	34 36.7 +60.0 150.0	33 44.6 +60.0 150.4	32 52.4 +60.0 150.7	32 00.0 +60.0 151.0	32																		
31	39 02.9 +59.8 148.4	38 11.7 +59.8 148.8	37 20.2 +59.9 149.2	36 28.5 +60.0 149.6	35 36.7 +59.9 150.0	34 44.6 +60.0 150.3	33 52.4 +60.0 150.7	33 00.0 +60.0 151.0	33																		
32	40 02.7 +59.8 148.3	39 11.5 +59.9 148.7	38 20.1 +59.9 149.2	37 28.5 +59.9 149.6	36 36.6 +60.0 150.0	35 44.6 +60.0 150.3	34 52.4 +60.0 150.7	34 00.0 +60.0 151.0	34																		
33	41 02.5 +59.8 148.2	40 11.4 +59.9 148.7	39 20.0 +59.9 149.1	38 28.4 +60.0 149.5	37 36.6 +60.0 149.9	36 44.6 +60.0 150.3	35 52.4 +60.0 150.7	35 00.0 +60.0 151.0	35																		
34	42 02.3 +59.8 148.1	41 11.3 +59.8 148.6	40 19.9 +59.9 149.0	39 28.4 +59.9 149.5	38 36.6 +59.9 149.9	37 44.6 +60.0 150.3	36 52.4 +60.0 150.6	36 00.0 +60.0 151.0	36																		
35	43 02.1 +59.8 148.0	42 11.1 +59.9 148.5	41 19.8 +59.9 149.0	40 28.3 +59.9 149.4	39 36.5 +60.0 149.8	38 44.6 +60.0 150.2	37 52.4 +60.0 150.6	37 00.0 +60.0 151.0	37																		
36	44 01.9 +59.8 147.9	43 11.0 +59.8 148.4	42 19.7 +59.9 148.9	41 28.2 +60.0 149.3	40 36.5 +60.0 149.8	39 44.6 +59.9 150.2	38 52.4 +60.0 150.6	38 00.0 +60.0 151.0	38																		
37	45 01.7 +59.8 147.8	44 10.8 +59.9 148.3	43 19.6 +59.9 148.8	42 28.2 +59.9 148.7	41 36.5 +59.9 149.7	40 44.5 +60.0 150.2	39 52.4 +60.0 150.6	39 00.0 +60.0 151.0	39																		
38	46 01.5 +59.8 147.7	45 10.7 +59.8 148.2	44 19.5 +59.9 148.7	43 28.1 +60.0 149.2	42 36.4 +60.0 149.7	41 44.5 +60.0 150.1	40 52.4 +60.0 150.6	40 00.0 +60.0 151.0	40																		
39	47 01.3 +59.8 147.5	46 10.5 +59.9 148.1	45 19.4 +59.9 148.6	44 28.1 +59.9 149.2	43 36.4 +60.0 149.6	42 44.5 +60.0 150.1	41 52.4 +60.0 150.6	41 00.0 +60.0 151.0	41																		
40	48 01.1 +59.7 147.4	47 10.4 +59.8 148.0	46 19.3 +59.9 148.6	45 28.0 +59.9 149.1	44 36.4 +59.9 149.6	43 44.5 +60.0 150.1	42 52.4 +60.0 150.6	42 00.0 +60.0 151.0	42																		
41	49 00.9 +59.7 147.3	50 10.3 +59.7 147.1	48 19.2 +59.8 147.6	47 27.9 +59.9 147.6	46 36.3 +60.0 149.5	45 44.5 +60.0 150.1	44 52.4 +60.0 150.5	44 00.0 +60.0 151.0	44																		
42	51 00.3 +59.8 147.0	51 09.6 +59.8 147.5	50 18.8 +59.9 148.2	49 27.7 +59.9 148.8	48 36.2 +60.0 149.4	47 44.4 +60.0 149.9	46 52.3 +60.0 150.5	46 00.0 +60.0 151.0	46																		
43	52 00.1 +59.7 146.9	52 09.4 +59.8 147.4	51 18.7 +59.9 148.1	50 27.6 +59.9 148.7	49 36.2 +59.9 148.3	48 44.4 +60.0 149.9	47 52.3 +60.0 150.5	47 00.0 +60.0 151.0	47																		
44	53 00.0 +59.6 146.8	53 08.3 +59.7 146.6	52 18.6 +59.8 147.3	51 27.5 +59.9 148.1	50 35.8 +60.0 148.9	54 44.3 +59.9 149.6	53 52.3 +																				

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 29°, 331°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	6 07.1 -59.9	150.8	5 14.7 -59.9	150.9	4 22.3 -59.9	150.9	3 29.9 -60.0	150.9	2 37.4 -60.0	151.0	1 44.9 -59.9	151.0	0 52.5 -60.0	151.0	0 00.0 +60.0	29.0	0 00.0 +60.0	29.0	0 00.0 +60.0	29.0	0 00.0 +60.0	29.0	0 00.0 +60.0	29.0	0
1	5 07.2 -59.9	150.9	4 14.8 -59.9	150.9	3 22.4 -60.0	150.9	2 29.9 -60.0	151.0	1 37.4 -59.9	151.0	0 45.0 -60.0	151.0	0 07.5 +60.0	29.0	1 00.0 +60.0	29.0	2 00.0 +60.0	29.0	3 00.0 +60.0	29.0	4 00.0 +60.0	29.0	5 00.0 +60.0	29.0	1
2	4 07.3 -59.9	150.9	3 14.9 -59.9	151.0	2 22.4 -60.0	151.0	1 29.9 -59.9	151.0	0 37.5 -60.0	151.0	0 15.0 +60.0	29.0	1 07.5 +60.0	29.0	2 00.0 +60.0	29.0	3 00.0 +60.0	29.0	4 00.0 +60.0	29.0	5 00.0 +60.0	29.0	2		
3	3 07.4 -59.9	151.0	2 15.0 -60.0	151.0	1 22.5 -60.0	151.0	0 30.0 -60.0	151.0	0 22.5 +60.0	28.9	1 15.0 +60.0	28.9	2 07.5 +60.0	29.0	3 07.5 +60.0	29.0	4 00.0 +60.0	29.0	5 00.0 +60.0	29.0	3				
4	2 07.5 -59.8	151.1	1 15.0 -59.9	151.1	0 22.5 -59.9	151.1	0 30.0 +60.0	28.9	1 22.5 +60.0	28.9	2 15.0 +60.0	28.9	3 07.5 +60.0	29.0	4 00.0 +60.0	29.0	5 00.0 +60.0	29.0	4						
5	1 07.7 -59.9	151.1	0 15.1 -59.9	151.1	0 37.4 +60.0	28.9	1 30.0 +59.9	28.9	2 22.5 +60.0	28.9	3 15.0 +60.0	28.9	4 07.5 +60.0	29.0	5 00.0 +60.0	29.0	6 00.0 +60.0	29.0	7 00.0 +60.0	29.0	5				
6	0 07.8 -59.9	151.2	0 44.8 +59.9	28.8	1 37.4 +59.9	28.8	2 29.9 +60.0	28.8	3 22.5 +59.9	28.8	4 15.0 +60.0	28.9	5 07.5 +60.0	29.0	6 00.0 +60.0	29.0	7 00.0 +60.0	29.0	8 00.0 +60.0	29.0	6				
7	0 52.1 +59.9	28.8	1 44.7 +60.0	28.8	2 37.3 +60.0	28.8	3 29.9 +60.0	28.8	4 22.4 +60.0	28.9	5 15.0 +60.0	28.9	6 07.5 +60.0	28.9	7 00.0 +60.0	29.0	8 00.0 +60.0	29.0	9 00.0 +60.0	29.0	7				
8	1 52.0 +59.9	28.7	2 44.7 +59.9	28.7	3 37.3 +59.9	28.8	4 29.9 +59.9	28.8	5 22.4 +60.0	28.8	6 15.0 +60.0	28.9	7 07.5 +60.0	28.9	8 00.0 +60.0	29.0	9 00.0 +60.0	29.0	8						
9	2 51.9 +59.9	28.6	3 44.6 +59.9	28.7	4 37.2 +60.0	28.7	5 29.8 +60.0	28.8	6 22.4 +60.0	28.8	7 15.0 +60.0	28.9	8 07.5 +60.0	28.9	9 00.0 +60.0	29.0	10 00.0 +60.0	29.0	9						
10	3 51.8 +59.9	28.6	4 44.5 +59.9	28.6	5 37.2 +59.9	28.7	6 29.8 +60.0	28.7	7 22.4 +60.0	28.8	8 15.0 +60.0	28.8	9 07.5 +60.0	28.9	10 00.0 +60.0	29.0	11 00.0 +60.0	29.0	10						
11	4 51.7 +59.9	28.5	5 44.4 +59.9	28.6	6 37.1 +59.9	28.6	7 29.8 +59.9	28.7	8 22.4 +60.0	28.8	9 15.0 +59.9	28.8	10 07.5 +60.0	28.9	11 00.0 +60.0	29.0	12 00.0 +60.0	29.0	11						
12	5 51.6 +59.9	28.5	6 44.3 +60.0	28.5	7 37.0 +60.0	28.6	8 29.7 +60.0	28.7	9 22.4 +59.9	28.7	10 14.9 +60.0	28.8	11 07.5 +60.0	28.9	12 00.0 +60.0	29.0	13 00.0 +60.0	29.0	12						
13	6 51.5 +59.9	28.4	7 44.3 +59.9	28.5	8 37.0 +59.9	28.5	9 29.7 +59.9	28.6	10 22.3 +60.0	28.7	11 14.9 +60.0	28.8	12 07.5 +60.0	28.9	13 00.0 +60.0	29.0	14 00.0 +60.0	29.0	13						
14	7 51.4 +59.9	28.4	8 44.2 +59.9	28.4	9 36.9 +60.0	28.5	10 29.6 +60.0	28.6	11 22.3 +60.0	28.7	12 14.9 +60.0	28.8	13 07.5 +60.0	28.9	14 00.0 +60.0	29.0	15 00.0 +60.0	29.0	14						
15	8 51.3 +59.9	28.3	9 44.1 +59.9	28.4	10 36.9 +59.9	28.5	11 29.6 +60.0	28.5	12 22.3 +60.0	28.6	13 14.9 +60.0	28.8	14 07.5 +60.0	28.9	15 00.0 +60.0	29.0	16 00.0 +60.0	29.0	15						
16	9 51.2 +59.9	28.2	10 44.0 +59.9	28.3	11 36.8 +60.0	28.4	12 29.6 +59.9	28.5	13 22.3 +60.0	28.6	14 14.9 +60.0	28.7	15 07.5 +60.0	28.9	16 00.0 +60.0	29.0	17 00.0 +60.0	29.0	16						
17	10 51.1 +59.9	28.2	11 43.9 +60.0	28.3	12 36.8 +59.9	28.4	13 29.5 +60.0	28.5	14 22.3 +59.9	28.6	15 14.9 +60.0	28.7	16 07.5 +60.0	28.9	17 00.0 +60.0	29.0	18 00.0 +60.0	29.0	17						
18	11 51.0 +59.9	28.1	12 43.9 +59.9	28.2	13 36.7 +60.0	28.3	14 29.5 +60.0	28.4	15 22.2 +60.0	28.6	16 14.9 +60.0	28.7	17 07.5 +60.0	28.8	18 00.0 +60.0	29.0	19 00.0 +60.0	29.0	18						
19	12 50.9 +59.8	28.0	13 43.8 +59.9	28.2	14 36.7 +59.9	28.3	15 29.5 +59.9	28.4	16 22.2 +60.0	28.5	17 14.9 +60.0	28.7	18 07.5 +60.0	28.8	19 00.0 +60.0	29.0	20 00.0 +60.0	29.0	19						
20	13 50.7 +59.9	28.0	14 43.7 +59.9	28.1	15 36.6 +59.9	28.2	16 29.4 +60.0	28.4	17 22.2 +60.0	28.5	18 14.9 +60.0	28.7	19 07.5 +60.0	28.8	20 00.0 +60.0	29.0	21 00.0 +60.0	29.0	20						
21	14 50.6 +59.9	27.9	15 43.6 +59.9	28.0	16 35.6 +60.0	28.2	17 29.4 +60.0	28.3	18 22.2 +59.9	28.5	19 14.9 +60.0	28.6	20 07.5 +60.0	28.8	21 00.0 +60.0	29.0	22 00.0 +60.0	29.0	21						
22	15 50.5 +59.9	27.9	16 43.5 +60.0	28.0	17 35.6 +59.9	28.1	18 29.4 +59.9	28.3	19 22.1 +60.0	28.5	20 14.9 +59.9	28.6	21 07.5 +60.0	28.8	22 00.0 +60.0	29.0	23 00.0 +60.0	29.0	22						
23	16 50.4 +59.9	27.8	17 43.5 +59.9	27.9	18 36.4 +60.0	28.1	19 29.3 +60.0	28.3	20 22.1 +60.0	28.4	21 14.8 +60.0	28.6	22 07.5 +60.0	28.8	23 00.0 +60.0	29.0	24 00.0 +60.0	29.0	23						
24	17 50.3 +59.9	27.7	18 43.4 +59.9	27.9	19 36.4 +59.9	28.0	20 29.3 +59.9	28.2	21 22.1 +60.0	28.4	22 14.8 +60.0	28.6	23 07.5 +60.0	28.8	24 00.0 +60.0	29.0	25 00.0 +60.0	29.0	24						
25	18 50.2 +59.9	27.7	19 43.3 +59.9	27.8	20 36.3 +59.9	28.0	21 29.2 +60.0	28.2	22 22.1 +60.0	28.4	23 14.8 +60.0	28.6	24 07.5 +60.0	28.8	25 00.0 +60.0	29.0	26 00.0 +60.0	29.0	25						
26	19 50.1 +59.8	27.6	20 43.2 +59.9	27.8	21 36.2 +60.0	27.9	22 29.2 +60.0	28.1	23 22.1 +59.9	28.3	24 14.8 +60.0	28.5	25 07.5 +60.0	28.8	26 00.0 +60.0	29.0	27 00.0 +60.0	29.0	26						
27	20 49.9 +59.9	27.5	21 43.1 +59.9	27.7	22 36.2 +59.9	27.9	23 29.2 +59.9	28.1	24 22.0 +60.0	28.3	25 14.8 +60.0	28.5	26 07.5 +60.0	28.8	27 00.0 +60.0	29.0	28 00.0 +60.0	29.0	27						
28	21 49.8 +59.9	27.5	22 43.0 +59.9	27.6	23 36.1 +60.0	27.8	24 29.1 +60.0	28.1	25 22.0 +60.0	28.3	26 14.8 +60.0	28.5	27 07.5 +60.0	28.7	28 00.0 +60.0	29.0	29 00.0 +60.0	29.0	28						
29	22 49.7 +59.9	27.4	23 42.9 +59.9	27.6	24 36.1 +59.9	27.8	25 29.1 +59.9	28.0	26 22.0 +60.0	28.2	27 14.8 +60.0	28.5	28 07.5 +60.0	28.7	29 00.0 +60.0	29.0	30 00.0 +60.0	29.0	29						
30	23 49.6 +59.8	27.3	24 42.8 +59.9	27.5	25 36.0 +59.9	27.7	26 29.0 +60.0	28.0	27 22.0 +59.9	28.2	28 14.8 +60.0	28.5	29 07.5 +60.0	28.7	30 00.0 +60.0	29.0	31 00.0 +60.0	29.0	30						
31	24 49.4 +59.9	27.2	25 42.7 +59.9	27.5	26 35.9 +60.0	27.7	27 29.0 +59.9	27.9	28 21.9 +60.0	28.2	29 14.8 +59.9	28.4	30 07.5 +59.9	28.7	31 00.0 +60.0	29.0	32 00.0 +60.0	29.0	31						
32	25 49.3 +59.9	27.2	26 42.6 +59.9	27.4	27 35.9 +59.9	27.6	28 28.9 +60.0	27.9	29 21.9 +60.0	28.1	30 14.7 +60.0	28.4	31 07.4 +60.0	28.7	32 00.0 +60.0	29.0	33 00.0 +60.0	29.0	32						
33	26 49.2 +59.9	27.1	27 42.5 +59.9	27.3	28 35.8 +59.9	27.6	29 28.9 +60.0	27.8	30 21.9 +60.0	28.1	31 14.7 +60.0	28.4	32 07.4 +60.0	28.7	33 00.0 +60.0	29.0	34 00.0 +60.0	29.0	33						
34	27 49.1 +59.8	27.0	28 42.4 +59.9	27.3	29 35.7 +59.9	27.5	30 28.9 +59.9	27.8	31 21.9 +59.9	28.1	32 14.7 +60.0	28.4	33 07.4 +60.0	28.7	34 00.0 +60.0	29.0	35 00.0 +60.0	29.0	34						
35	28 48.9 +59.9	27.0	29 42.3 +59.9	27.2	30 35.6 +60.0	27.5	31 28.8 +60.0	27.8	32 21.8 +60.0	28.0	33 14.7 +60.0	28.3	34 07.4 +60.0	28.7	35 00.0 +60.0	29.0	36 00.0 +60.0	29.0	35						
36	29 48.8 +59.8	26.9	30 42.2 +59.9	27.1	31 35.6 +59.9	27.4	32 28.8 +59.9	27.7	33 21.8 +60.0	28.0	34 14.7 +60.0	28.3	35 07.4 +60.0	28.7	36 00.0 +60.0	29.0	37 00.0 +60.0	29.0	36						
37	30 48.6 +59.9	26.8	31 42.1 +59.9	27.1	32 35.5 +59.9	27.4	33 28.7 +60.0	27.7	34 21.8 +59.9	28.0	35 14.7 +60.0	28.3	36 07.4 +60.0	28.6	37 00.0 +60.0	29.0	38								

30°, 330° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Dec.																					
0	6 03.5	+59.9	149.8	5 11.6	+59.9	149.9	4 19.7	+60.0	149.9	3 27.8	+60.0	149.9	2 35.9	+59.9	150.0	1 43.9	+60.0	150.0	0 52.0	+60.0	150.0	0 00.0	+60.0	150.0	0
1	7 03.4	+59.9	149.8	6 11.5	+60.0	149.8	5 19.7	+59.9	149.9	4 27.8	+59.9	149.9	3 35.8	+60.0	149.9	2 43.9	+60.0	150.0	1 52.0	+60.0	150.0	1 00.0	+60.0	150.0	1
2	8 03.3	+59.9	149.7	7 11.5	+59.9	149.8	6 19.6	+60.0	149.8	5 27.7	+60.0	149.9	4 35.8	+60.0	149.9	3 43.9	+60.0	149.9	2 52.0	+60.0	150.0	2 00.0	+60.0	150.0	2
3	9 03.2	+59.8	149.6	8 11.4	+59.9	149.7	7 19.6	+59.9	149.8	6 27.7	+60.0	149.8	5 35.8	+60.0	149.9	4 43.9	+60.0	149.9	3 52.0	+60.0	150.0	3 00.0	+60.0	150.0	3
4	10 03.0	+59.9	149.6	9 11.3	+59.9	149.7	8 19.5	+59.9	149.7	7 27.7	+59.9	149.8	6 35.8	+60.0	149.9	5 43.9	+60.0	149.9	4 52.0	+59.9	150.0	4 00.0	+60.0	150.0	4
5	11 02.9	+59.9	149.5	10 11.2	+59.9	149.6	9 19.4	+60.0	149.7	8 27.6	+60.0	149.8	7 35.8	+59.9	149.8	6 43.9	+60.0	149.9	5 51.9	+60.0	150.0	5 00.0	+60.0	150.0	5
6	12 02.8	+59.9	149.4	11 11.1	+59.9	149.5	10 19.4	+59.9	149.6	9 27.6	+59.9	149.7	8 35.7	+60.0	149.8	7 43.9	+60.0	149.9	6 51.9	+60.0	149.9	6 00.0	+60.0	150.0	6
7	13 02.7	+59.9	149.4	12 11.0	+60.0	149.5	11 19.3	+60.0	149.6	10 27.5	+60.0	149.7	9 35.7	+60.0	149.8	8 43.9	+59.9	149.9	7 51.9	+60.0	149.9	7 00.0	+60.0	150.0	7
8	14 02.6	+59.9	149.3	13 11.0	+59.9	149.4	12 19.3	+59.9	149.5	11 27.5	+60.0	149.7	10 35.7	+60.0	149.8	9 43.8	+60.0	149.8	8 51.9	+60.0	149.9	8 00.0	+60.0	150.0	8
9	15 02.5	+59.9	149.2	14 10.9	+59.9	149.4	13 19.2	+59.9	149.5	12 27.5	+59.9	149.6	11 35.7	+60.0	149.7	10 43.8	+60.0	149.8	9 51.9	+60.0	149.9	9 00.0	+60.0	150.0	9
10	16 02.3	+59.9	149.2	15 10.8	+59.9	149.3	14 19.1	+60.0	149.5	13 27.4	+60.0	149.6	12 35.7	+59.9	149.7	11 43.8	+60.0	149.8	10 51.9	+60.0	149.9	10 00.0	+60.0	150.0	10
11	17 02.2	+59.9	149.1	16 10.7	+59.9	149.3	15 19.1	+59.9	149.4	14 27.4	+60.0	149.5	13 35.6	+60.0	149.7	12 43.8	+60.0	149.8	11 51.9	+60.0	149.9	11 00.0	+60.0	150.0	11
12	18 02.1	+59.9	149.0	17 10.6	+59.9	149.2	16 19.0	+60.0	149.4	15 27.4	+59.9	149.5	14 35.6	+60.0	149.6	13 43.8	+60.0	149.8	12 51.9	+60.0	149.9	12 00.0	+60.0	150.0	12
13	19 02.0	+59.8	149.0	18 10.5	+59.9	149.2	17 19.0	+59.9	149.3	16 27.3	+60.0	149.5	15 35.6	+60.0	149.6	14 43.8	+60.0	149.8	13 51.9	+60.0	149.9	13 00.0	+60.0	150.0	13
14	20 01.8	+59.9	148.9	19 10.4	+59.9	149.1	18 18.9	+59.9	149.3	17 27.3	+59.9	149.4	16 35.6	+59.9	149.6	15 43.8	+60.0	149.7	14 51.9	+60.0	149.9	14 00.0	+60.0	150.0	14
15	21 01.7	+59.9	148.8	20 10.3	+59.9	149.0	19 18.8	+60.0	149.2	18 27.2	+60.0	149.4	17 35.5	+60.0	149.6	16 43.8	+60.0	149.7	15 51.9	+60.0	149.9	15 00.0	+60.0	150.0	15
16	22 01.6	+59.8	148.8	21 10.2	+59.9	149.0	20 18.8	+59.9	149.2	19 27.2	+59.9	149.4	18 35.5	+60.0	149.5	17 43.8	+60.0	149.7	16 51.9	+60.0	149.9	16 00.0	+60.0	150.0	16
17	23 01.5	+59.8	148.7	22 10.1	+59.9	148.9	21 18.7	+59.9	149.1	20 27.1	+60.0	149.3	19 35.5	+60.0	149.5	18 43.8	+59.9	149.7	17 51.9	+60.0	149.8	17 00.0	+60.0	150.0	17
18	24 01.3	+59.8	148.6	23 10.0	+59.9	148.9	22 18.6	+60.0	149.1	21 27.1	+60.0	149.3	20 35.5	+60.0	149.5	19 43.7	+60.0	149.7	18 51.9	+60.0	149.8	18 00.0	+60.0	150.0	18
19	25 01.2	+59.8	148.6	24 09.9	+59.9	148.8	23 18.6	+59.9	149.0	22 27.1	+59.9	149.2	21 35.5	+59.9	149.4	20 43.7	+60.0	149.6	19 51.9	+60.0	149.8	19 00.0	+60.0	150.0	19
20	26 01.1	+59.8	148.5	25 09.8	+59.9	148.7	24 18.5	+59.9	149.0	23 27.0	+60.0	149.2	22 35.4	+60.0	149.4	21 43.7	+60.0	149.6	20 51.9	+60.0	149.8	20 00.0	+60.0	150.0	20
21	27 00.9	+59.8	148.4	26 09.7	+59.9	148.7	25 18.4	+60.0	149.0	24 27.0	+59.9	149.2	23 35.4	+60.0	149.4	22 43.7	+60.0	149.6	21 51.9	+60.0	149.8	21 00.0	+60.0	150.0	21
22	28 00.8	+59.8	148.3	27 09.6	+59.9	148.6	26 18.4	+59.9	148.9	25 26.9	+60.0	149.1	24 35.4	+60.0	149.3	23 43.7	+60.0	149.6	22 51.9	+60.0	149.8	22 00.0	+60.0	150.0	22
23	29 00.6	+59.9	148.2	28 09.5	+59.9	148.5	27 18.3	+59.9	148.8	26 26.9	+59.9	149.1	25 35.4	+59.9	149.3	24 43.7	+60.0	149.6	23 51.9	+60.0	149.8	23 00.0	+60.0	150.0	23
24	30 00.5	+59.8	148.2	29 09.4	+59.9	148.5	28 18.2	+59.9	148.7	27 26.8	+60.0	149.0	26 35.3	+60.0	149.3	25 43.7	+60.0	149.5	24 51.9	+60.0	149.8	24 00.0	+60.0	150.0	24
25	31 00.3	+59.9	148.1	30 09.3	+59.9	148.4	29 18.1	+60.0	148.7	28 26.8	+59.9	149.0	27 35.3	+60.0	149.3	26 43.7	+60.0	149.5	25 51.9	+60.0	149.8	25 00.0	+60.0	150.0	25
26	32 00.2	+59.8	148.0	31 09.2	+59.9	148.3	30 18.1	+59.9	148.6	29 26.7	+60.0	148.9	28 35.3	+60.0	149.2	27 43.7	+59.9	149.5	26 51.9	+60.0	149.8	26 00.0	+60.0	150.0	26
27	33 00.0	+59.9	147.9	32 09.1	+59.9	148.3	31 18.0	+59.9	148.6	30 26.7	+60.0	148.9	29 35.3	+59.9	149.2	28 43.6	+60.0	149.5	27 51.9	+60.0	149.7	27 00.0	+60.0	150.0	27
28	33 59.9	+59.8	147.8	33 09.0	+59.9	148.2	32 17.9	+59.9	148.5	31 26.7	+60.0	149.8	30 35.2	+60.0	149.1	29 43.6	+60.0	149.4	28 51.9	+60.0	149.7	28 00.0	+60.0	150.0	28
29	34 59.7	+59.8	147.7	34 08.9	+59.8	148.1	33 17.8	+59.9	148.5	32 26.6	+59.9	148.8	31 35.2	+60.0	149.1	30 43.6	+60.0	149.4	29 51.9	+60.0	149.7	29 00.0	+60.0	150.0	29
30	35 59.5	+59.9	147.6	35 08.7	+59.9	148.0	34 17.7	+60.0	148.4	33 26.5	+60.0	148.7	32 35.2	+59.9	149.1	31 43.6	+60.0	149.4	30 51.9	+60.0	149.7	30 00.0	+60.0	150.0	30
31	36 59.4	+59.8	147.5	36 08.6	+59.9	147.9	35 17.7	+59.9	148.3	34 26.5	+59.9	148.7	33 35.1	+60.0	149.0	32 43.6	+60.0	149.4	31 51.9	+60.0	149.7	31 00.0	+60.0	150.0	31
32	37 59.2	+59.8	147.5	37 08.5	+59.9	147.9	36 17.6	+59.9	148.3	35 26.4	+60.0	148.6	34 35.1	+60.0	149.0	33 43.6	+60.0	149.3	32 51.9	+60.0	149.7	32 00.0	+60.0	150.0	32
33	38 59.0	+59.8	147.4	38 08.4	+59.8	147.8	37 17.5	+59.9	148.2	36 26.4	+59.9	148.6	35 35.1	+59.9	149.0	34 43.6	+60.0	149.3	33 51.9	+60.0	149.7	33 00.0	+60.0	150.0	33
34	39 58.8	+59.8	147.3	39 08.2	+59.9	147.7	38 17.4	+59.9	148.1	37 26.3	+60.0	148.5	36 35.0	+59.9	148.9	35 43.6	+59.9	149.3	34 51.9	+60.0	149.7	34 00.0	+60.0	150.0	34
40	40 58.6	+59.8	147.1	40 08.1	+59.8	147.6	39 17.3	+59.9	148.0	38 26.3	+59.9	148.5	37 35.0	+60.0	148.9	36 43.5	+60.0	149.3	35 51.9	+60.0	149.6	35 00.0	+60.0	150.0	35
41	41 58.4	+59.8	147.0	41 07.9	+59.9	147.5	40 17.2	+59.9	148.0	39 26.2	+59.9	148.4	38 35.0	+60.0	148.8	37 43.5	+60.0	149.2	36 51.9	+60.0	14				

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 30°, 330°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	6 03.5 -59.9	149.8	5 11.6 -59.9	149.9	4 19.7 -59.9	149.9	3 27.8 -60.0	149.9	2 35.9 -60.0	150.0	1 43.9 -60.0	150.0	0 52.0 -60.0	150.0	0 00.0 +60.0	30.0	0 00.0 +60.0	30.0	0 00.0 +60.0	30.0	0 00.0 +60.0	30.0	0 00.0 +60.0	30.0	0
1	5 03.6 -59.9	149.9	4 11.7 -59.9	149.9	3 19.8 -60.0	149.9	2 27.8 -59.9	150.0	1 35.9 -60.0	150.0	0 43.9 -60.0	150.0	0 08.0 +60.0	30.0	1 00.0 +60.0	30.0	2 00.0 +60.0	30.0	3 00.0 +60.0	30.0	4 00.0 +60.0	30.0	5 00.0 +60.0	30.0	1
2	4 03.7 -59.9	149.9	3 11.8 -59.9	150.0	2 19.8 -59.9	150.0	1 27.9 -60.0	150.0	0 35.9 -60.0	150.0	0 24.1 +60.0	30.0	1 16.1 +59.9	30.0	2 08.0 +60.0	30.0	3 00.0 +60.0	30.0	4 00.0 +60.0	30.0	5 00.0 +60.0	30.0	2		
3	3 03.8 -59.8	150.0	2 11.9 -59.9	150.0	1 19.9 -59.9	150.0	0 27.9 -59.9	150.0	0 32.0 +60.0	29.9	1 24.1 +59.9	29.9	2 16.0 +60.0	29.9	3 08.0 +60.0	30.0	4 00.0 +60.0	30.0	5 00.0 +60.0	30.0	6 00.0 +60.0	30.0	3		
4	2 04.0 -59.9	150.1	1 12.0 -60.0	150.1	0 20.0 -60.0	150.1	0 40.0 +59.9	29.9	1 32.0 +60.0	29.9	2 24.0 +60.0	29.9	3 16.0 +60.0	29.9	4 08.0 +60.0	30.0	5 00.0 +60.0	30.0	6 00.0 +60.0	30.0	7 00.0 +60.0	30.0	4		
5	1 04.1 -59.9	150.1	0 12.0 -59.9	150.1	0 47.9 +59.9	29.8	1 39.9 +60.0	29.8	2 32.0 +59.9	29.8	3 24.0 +60.0	29.8	4 16.0 +60.0	29.8	5 08.0 +60.0	29.9	6 00.0 +60.0	30.0	7 00.0 +60.0	30.0	8 00.0 +60.0	30.0	9 00.0 +60.0	30.0	9
6	0 04.2 -59.9	150.2	0 47.9 +59.9	29.8	1 39.9 +60.0	29.8	2 39.8 +60.0	29.7	3 41.9 +60.0	29.8	5 24.0 +59.9	29.8	6 16.0 +60.0	29.9	7 08.0 +60.0	29.9	8 00.0 +60.0	30.0	9 00.0 +60.0	30.0	10 00.0 +60.0	30.0	10		
7	0 55.7 +59.9	29.8	1 47.8 +59.9	29.8	2 39.9 +59.9	29.8	3 31.9 +60.0	29.8	4 24.0 +60.0	29.9	5 16.0 +60.0	29.9	6 08.0 +60.0	29.9	7 00.0 +60.0	30.0	8 00.0 +60.0	30.0	9 00.0 +60.0	30.0	10 00.0 +60.0	30.0	7		
8	1 55.6 +59.9	29.7	2 47.7 +59.9	29.7	3 39.8 +60.0	29.7	4 31.9 +60.0	29.8	5 24.0 +59.9	29.8	6 16.0 +60.0	29.9	7 08.0 +60.0	29.9	8 00.0 +60.0	30.0	9 00.0 +60.0	30.0	10 00.0 +60.0	30.0	8				
9	2 55.5 +59.9	29.6	3 47.6 +60.0	29.7	4 39.8 +59.9	29.7	5 31.9 +59.9	29.7	6 23.9 +60.0	29.8	7 16.0 +60.0	29.9	8 08.0 +60.0	29.9	9 00.0 +60.0	30.0	10 00.0 +60.0	30.0	11 00.0 +60.0	30.0	9				
10	3 55.4 +59.9	29.6	4 47.6 +59.9	29.6	5 39.7 +59.9	29.7	6 31.8 +60.0	29.7	7 23.9 +60.0	29.8	8 16.0 +60.0	29.8	9 08.0 +60.0	29.9	10 00.0 +60.0	30.0	11 00.0 +60.0	30.0	12 00.0 +60.0	30.0	13 00.0 +60.0	30.0	14 00.0 +60.0	30.0	14
11	4 55.3 +59.9	29.5	5 47.5 +59.9	29.6	6 39.6 +60.0	29.6	7 31.8 +60.0	29.7	8 23.9 +60.0	29.7	9 16.0 +60.0	29.8	10 08.0 +60.0	29.9	11 00.0 +60.0	30.0	12 00.0 +60.0	30.0	13 00.0 +60.0	30.0	14 00.0 +60.0	30.0	15 00.0 +60.0	30.0	15
12	5 55.2 +59.8	29.5	6 47.4 +59.9	29.5	7 39.6 +59.9	29.6	8 31.8 +59.9	29.6	9 23.9 +60.0	29.7	10 16.0 +60.0	29.8	11 08.0 +60.0	29.9	12 00.0 +60.0	30.0	13 00.0 +60.0	30.0	14 00.0 +60.0	30.0	15 00.0 +60.0	30.0	16 00.0 +60.0	30.0	16
13	6 55.0 +59.9	29.4	7 47.3 +59.9	29.5	8 39.5 +60.0	29.5	9 31.7 +60.0	29.6	10 23.9 +59.9	29.7	11 16.0 +60.0	29.8	12 08.0 +60.0	29.9	13 00.0 +60.0	30.0	14 00.0 +60.0	30.0	15 00.0 +60.0	30.0	16 00.0 +60.0	30.0	17 00.0 +60.0	30.0	17
14	7 54.9 +59.9	29.3	8 47.2 +59.9	29.4	9 39.5 +59.9	29.5	10 31.7 +59.9	29.6	11 23.8 +60.0	29.7	12 16.0 +59.9	29.8	13 08.0 +60.0	29.9	14 00.0 +60.0	30.0	15 00.0 +60.0	30.0	16 00.0 +60.0	30.0	17 00.0 +60.0	30.0	18 00.0 +60.0	30.0	18
15	8 54.8 +59.9	29.3	9 47.1 +59.9	29.3	10 39.4 +60.0	29.4	11 31.6 +60.0	29.5	12 23.8 +60.0	29.6	13 15.9 +60.0	29.7	14 08.0 +60.0	29.9	15 00.0 +60.0	30.0	16 00.0 +60.0	30.0	17 00.0 +60.0	30.0	18 00.0 +60.0	30.0	19 00.0 +60.0	30.0	19
16	9 54.7 +59.9	29.2	10 47.0 +60.0	29.3	11 39.4 +59.9	29.4	12 31.6 +60.0	29.5	13 23.8 +60.0	29.6	14 15.9 +60.0	29.7	15 08.0 +60.0	29.9	16 00.0 +60.0	30.0	17 00.0 +60.0	30.0	18 00.0 +60.0	30.0	19 00.0 +60.0	30.0	20 00.0 +60.0	30.0	20
17	10 54.6 +59.9	29.1	11 47.0 +59.9	29.2	12 39.3 +59.9	29.3	13 31.6 +59.9	29.5	14 23.8 +60.0	29.6	15 15.9 +60.0	29.7	16 08.0 +60.0	29.9	17 00.0 +60.0	30.0	18 00.0 +60.0	30.0	19 00.0 +60.0	30.0	20 00.0 +60.0	30.0	21 00.0 +60.0	30.0	21
18	11 54.5 +59.9	29.1	12 46.9 +59.9	29.2	13 39.2 +60.0	29.3	14 31.5 +60.0	29.4	15 23.8 +59.9	29.6	16 15.9 +60.0	29.7	17 08.0 +60.0	29.8	18 00.0 +60.0	30.0	19 00.0 +60.0	30.0	20 00.0 +60.0	30.0	21 00.0 +60.0	30.0	22 00.0 +60.0	30.0	22
19	12 54.4 +59.8	29.0	13 46.8 +59.9	29.1	14 39.2 +59.9	29.3	15 31.5 +59.9	29.4	16 23.7 +60.0	29.5	17 15.9 +60.0	29.7	18 08.0 +60.0	29.8	19 00.0 +60.0	30.0	20 00.0 +60.0	30.0	21 00.0 +60.0	30.0	22 00.0 +60.0	30.0	23 00.0 +60.0	30.0	23
20	13 54.2 +59.9	28.9	14 46.7 +59.9	29.1	15 39.1 +59.9	29.2	16 31.4 +60.0	29.3	17 23.7 +60.0	29.5	18 15.9 +60.0	29.7	19 08.0 +60.0	29.8	20 00.0 +60.0	30.0	21 00.0 +60.0	30.0	22 00.0 +60.0	30.0	23 00.0 +60.0	30.0	24 00.0 +60.0	30.0	24
21	14 54.1 +59.9	28.9	15 46.6 +59.9	29.0	16 39.0 +60.0	29.2	17 31.4 +60.0	29.3	18 23.7 +60.0	29.5	19 15.9 +60.0	29.6	20 08.0 +60.0	29.8	21 00.0 +60.0	30.0	22 00.0 +60.0	30.0	23 00.0 +60.0	30.0	24 00.0 +60.0	30.0	25 00.0 +60.0	30.0	25
22	15 54.0 +59.9	28.8	16 46.5 +59.9	29.0	17 39.0 +59.9	29.1	18 31.4 +59.9	29.3	19 23.7 +59.9	29.4	20 15.9 +60.0	29.6	21 08.0 +60.0	29.8	22 00.0 +60.0	30.0	23 00.0 +60.0	30.0	24 00.0 +60.0	30.0	25 00.0 +60.0	30.0	26 00.0 +60.0	30.0	26
23	16 53.9 +59.8	28.8	17 46.4 +59.9	28.9	18 38.9 +60.0	29.1	19 31.3 +60.0	29.2	20 23.6 +60.0	29.4	21 15.9 +60.0	29.6	22 08.0 +60.0	29.8	23 00.0 +60.0	30.0	24 00.0 +60.0	30.0	25 00.0 +60.0	30.0	26 00.0 +60.0	30.0	27 00.0 +60.0	30.0	27
24	17 53.8 +59.8	28.7	18 46.3 +60.0	28.8	19 38.9 +59.9	29.0	20 31.3 +59.9	29.2	21 23.6 +60.0	29.4	22 15.9 +59.9	29.6	23 08.0 +60.0	29.8	24 00.0 +60.0	30.0	25 00.0 +60.0	30.0	26 00.0 +60.0	30.0	27 00.0 +60.0	30.0	28 00.0 +60.0	30.0	28
25	18 53.6 +59.8	28.6	19 46.3 +59.9	28.8	20 38.8 +59.9	29.0	21 31.2 +60.0	29.2	22 23.6 +60.0	29.3	23 15.8 +60.0	29.6	24 08.0 +60.0	29.8	25 00.0 +60.0	30.0	26 00.0 +60.0	30.0	27 00.0 +60.0	30.0	28 00.0 +60.0	30.0	29 00.0 +60.0	30.0	29
26	19 53.5 +59.8	28.5	20 46.2 +59.9	28.7	21 38.7 +60.0	28.9	22 31.2 +60.0	29.1	23 23.6 +59.9	29.3	24 15.8 +60.0	29.5	25 08.0 +60.0	29.8	26 00.0 +60.0	30.0	27 00.0 +60.0	30.0	28 00.0 +60.0	30.0	29 00.0 +60.0	30.0	30 00.0 +60.0	30.0	30
27	20 53.4 +59.8	28.5	21 46.1 +59.9	28.7	22 38.7 +59.9	28.9	23 31.2 +59.9	29.1	24 23.5 +60.0	29.3	25 15.8 +60.0	29.5	26 08.0 +60.0	29.8	27 00.0 +60.0	30.0	28 00.0 +60.0	30.0	29 00.0 +60.0	30.0	30 00.0 +60.0	30.0	31 00.0 +60.0	30.0	31
28	21 53.2 +59.8	28.4	22 46.0 +59.9	28.6	23 38.4 +59.9	28.8	24 31.5 +60.0	29.0	25 23.5 +60.0	29.2	26 15.6 +60.0	29.4	27 08.0 +60.0	29.7	28 00.0 +60.0	30.0	29 00.0 +60.0	30.0	30 00.0 +60.0	30.0	31 00.0 +60.0	30.0	32 00.0 +60.0	30.0	32
29	22 52.9 +59.8	28.3	23 45.8 +59.9	28.5	24 38.1 +59.9	28.7	25 30.8 +60.0	28.8	26 23.3 +60.0	29.0	27 15.7 +60.0	29.3	28 08.0 +60.0	29.7	29 00.0 +60.0	30.0	30 00.0 +60.0	30.0	31 00.0 +60.0	30.0	32 00.0 +60.0	30.0	33 00.0 +60.0	30.0	33
30	23 52.0 +59.8	28.3	24 45.7 +59.9	28.5	25 38.1 +59.9	28.7	26 30.8 +59.9	28.9	27 23.5 +60.0	29.2	28 15.7 +60.0	29.5	29 08.0 +60.0	29.7</td											

31°, 329° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	Dec.				
0	5	59.8	+59.9	148.8	5	08.4	+59.9	148.9	4	17.1	+59.9	148.9	3	25.7	+59.9	148.9	2	34.3	+59.9	149.0	1	42.9	+59.9	149.0	0	51.4	+60.0	149.0	0
1	6	59.7	+59.8	148.7	6	08.3	+60.0	148.8	5	17.0	+59.9	148.9	4	25.6	+60.0	148.9	3	34.2	+60.0	148.9	2	42.8	+60.0	149.0	1	51.4	+60.0	149.0	1
2	7	59.5	+59.9	148.7	7	08.3	+59.9	148.8	6	16.9	+60.0	148.8	5	25.6	+60.0	148.9	4	34.2	+60.0	148.9	3	42.8	+60.0	148.9	2	51.4	+60.0	149.0	2
3	8	59.4	+59.8	148.6	8	08.2	+59.9	148.7	7	16.9	+59.9	148.8	6	25.6	+59.9	148.8	5	34.2	+60.0	148.9	4	42.8	+60.0	148.9	3	51.4	+60.0	149.0	3
4	9	59.3	+59.9	148.6	9	08.1	+59.9	148.6	8	16.8	+60.0	148.7	7	25.5	+60.0	148.8	6	34.2	+60.0	148.9	5	42.8	+60.0	148.9	4	51.4	+60.0	149.0	4
5	10	59.2	+59.8	148.5	10	08.0	+59.9	148.6	9	16.8	+59.9	148.7	8	25.5	+59.9	148.8	7	34.2	+59.9	148.8	6	42.8	+60.0	148.9	5	51.4	+60.0	149.0	5
6	11	59.0	+59.9	148.4	11	07.9	+59.9	148.5	10	16.7	+59.9	148.6	9	25.4	+60.0	148.7	8	34.1	+60.0	148.8	7	42.8	+60.0	148.9	6	51.4	+60.0	149.0	6
7	12	58.9	+59.9	148.4	12	07.8	+59.9	148.5	11	16.6	+60.0	148.6	10	25.4	+60.0	148.7	9	34.1	+60.0	148.8	8	42.8	+60.0	148.8	7	51.4	+60.0	149.0	7
8	13	58.8	+59.8	148.3	13	07.7	+59.9	148.4	12	16.6	+59.9	148.5	11	25.4	+59.9	148.6	10	34.1	+60.0	148.7	9	42.8	+60.0	148.8	8	51.4	+60.0	149.0	8
9	14	58.7	+59.8	148.2	14	07.6	+59.9	148.4	13	16.5	+59.9	148.5	12	25.3	+60.0	148.6	11	34.1	+59.9	148.7	10	42.8	+60.0	148.8	9	51.4	+60.0	149.0	9
10	15	58.5	+59.9	148.2	15	07.5	+59.9	148.3	14	16.4	+60.0	148.4	13	25.3	+59.9	148.6	12	34.0	+60.0	148.7	11	42.8	+59.9	148.8	10	51.4	+60.0	148.9	10
11	16	58.4	+59.9	148.1	16	07.4	+59.9	148.2	15	16.4	+59.9	148.4	14	25.2	+60.0	148.5	13	34.0	+60.0	148.7	12	42.7	+60.0	148.8	11	51.4	+60.0	149.0	11
12	17	58.3	+59.9	148.0	17	07.3	+59.9	148.2	16	16.3	+59.9	148.3	15	25.2	+60.0	148.5	14	34.0	+60.0	148.6	13	42.7	+60.0	148.8	12	51.4	+60.0	149.0	12
13	18	58.2	+59.8	148.0	18	07.2	+59.9	148.1	17	16.2	+60.0	148.3	16	25.2	+59.9	148.5	15	34.0	+60.0	148.6	14	42.7	+60.0	148.7	13	51.4	+60.0	149.0	13
14	19	58.0	+59.9	147.9	19	07.1	+60.0	148.1	18	16.2	+59.9	148.2	17	25.1	+60.0	148.4	16	34.0	+59.9	148.5	15	42.7	+60.0	148.7	14	51.4	+60.0	149.0	14
15	20	57.9	+59.8	147.8	20	07.1	+59.9	148.0	19	16.1	+59.9	148.2	18	25.1	+59.9	148.4	17	33.9	+60.0	148.5	16	42.7	+60.0	148.7	15	51.4	+60.0	148.9	15
16	21	57.7	+59.9	147.7	21	07.0	+59.9	147.9	20	16.0	+60.0	148.1	19	25.0	+60.0	148.3	18	33.9	+60.0	148.5	17	42.7	+60.0	148.7	16	51.4	+60.0	149.0	16
17	22	57.6	+59.9	147.7	22	06.9	+59.8	147.9	21	16.0	+59.9	148.1	20	25.0	+59.9	148.3	19	33.9	+60.0	148.5	18	42.7	+60.0	148.7	17	51.4	+60.0	149.0	17
18	23	57.5	+59.8	147.6	23	06.7	+59.9	147.8	22	15.9	+59.9	148.0	21	24.9	+60.0	148.3	20	33.9	+59.9	148.5	19	42.7	+60.0	148.6	18	51.4	+60.0	149.0	18
19	24	57.3	+59.9	147.5	24	06.6	+59.9	147.8	23	15.8	+60.0	148.0	22	24.9	+59.9	148.2	21	33.8	+60.0	148.4	20	42.7	+60.0	148.7	19	51.4	+60.0	149.0	19
20	25	57.2	+59.8	147.4	25	06.5	+59.9	147.7	24	15.8	+59.9	147.9	23	24.8	+60.0	148.2	22	33.8	+60.0	148.4	21	42.7	+59.9	148.6	20	51.4	+60.0	148.8	20
21	26	57.0	+59.9	147.4	26	06.4	+59.9	147.6	25	15.7	+59.9	147.9	24	24.8	+60.0	148.1	23	33.8	+60.0	148.4	22	42.6	+60.0	148.6	21	51.4	+60.0	149.0	21
22	27	56.9	+59.8	147.3	27	06.3	+59.9	147.6	26	15.6	+59.9	147.8	25	24.8	+59.9	148.1	24	33.8	+59.9	148.3	23	42.6	+60.0	148.6	22	51.4	+60.0	149.0	22
23	28	56.7	+59.9	147.2	28	06.2	+59.9	147.5	27	15.5	+60.0	147.8	26	24.7	+60.0	148.0	25	33.7	+60.0	148.3	24	42.6	+60.0	148.5	23	51.4	+60.0	149.0	23
24	29	56.6	+59.8	147.1	29	06.1	+59.9	147.4	28	15.5	+59.9	147.7	27	24.7	+59.9	148.0	26	33.7	+60.0	148.3	25	42.6	+60.0	148.5	24	51.4	+60.0	149.0	24
25	30	56.4	+59.8	147.0	30	06.0	+59.9	147.3	29	15.4	+59.9	147.7	28	24.6	+60.0	147.9	27	33.7	+59.9	148.2	26	42.6	+60.0	148.5	25	51.4	+60.0	148.8	25
26	31	56.2	+59.9	146.9	31	05.9	+59.8	147.3	30	15.3	+59.9	147.6	29	24.6	+59.9	147.9	28	33.6	+60.0	148.2	27	42.6	+60.0	148.5	26	51.4	+60.0	149.0	26
27	32	56.1	+59.8	146.9	32	05.7	+59.9	147.2	31	15.2	+59.9	147.5	30	24.5	+60.0	147.9	29	33.6	+60.0	148.2	28	42.6	+60.0	148.5	27	51.4	+60.0	149.0	27
28	33	55.9	+59.8	146.8	33	05.6	+59.9	147.1	32	15.1	+59.9	147.5	31	24.5	+59.9	147.8	30	33.6	+60.0	148.1	29	42.6	+59.9	148.7	28	51.4	+60.0	149.0	28
29	34	55.7	+59.8	146.7	34	05.5	+59.9	147.0	33	15.0	+60.0	147.4	32	24.4	+59.9	147.7	31	33.6	+59.9	148.1	30	42.5	+60.0	148.4	29	51.4	+59.9	148.7	29
30	35	55.6	+59.8	146.6	35	05.4	+59.8	147.0	34	15.0	+59.9	147.3	33	24.3	+60.0	147.7	32	33.5	+60.0	148.0	31	42.5	+60.0	148.4	30	51.3	+60.0	148.7	30
31	36	55.4	+59.8	146.5	36	05.2	+59.9	146.9	35	14.9	+59.9	147.3	34	24.3	+59.9	147.7	33	33.5	+60.0	148.0	32	42.5	+60.0	148.4	31	51.3	+60.0	149.0	31
32	37	55.2	+59.8	146.4	37	05.1	+59.9	146.8	36	14.8	+59.9	147.2	35	24.2	+60.0	147.6	34	33.5	+59.9	148.0	33	42.5	+60.0	148.3	32	51.3	+60.0	149.0	32
33	38	55.0	+59.8	146.3	38	05.0	+59.8	146.7	37	14.7	+59.9	147.1	36	24.2	+59.9	147.5	35	33.4	+60.0	147.9	34	42.5	+60.0	148.3	33	51.3	+60.0	149.0	33
34	39	54.8	+59.8	146.2	39	04.8	+59.9	146.6	38	14.6	+59.9	147.5	37	24.1	+59.9	147.3	36	33.0	+60.0	147.9	35	42.5	+60.0	148.3	34	51.3	+60.0	149.0	34
35	40	54.6	+59.8	146.1	40	04.7	+59.8	146.5	39	14.5	+59.9	147.0	38	24.0	+60.0	147.4	37	33.4	+59.9	147.8	36	42.5	+59.9	148.2	35	51.3	+60.0	148.6	35
36	41	54.4	+59.8	146.0	41	04.5	+59.9	146.4	40	14.4	+59.9	146.9	39	24.0	+59.9	147.4	38	33.3	+60.0	147.8	37	42.4	+60.0	148.2	36	51.3	+60.0	149.0	36
37	42	54.2	+59.7	145.8	42	04.4	+59.8	1																					

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 31°, 329°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	5 59.8 -59.9	148.8	5 08.4 -59.9	148.9	4 17.1 -60.0	148.9	3 25.7 -60.0	148.9	2 34.3 -60.0	149.0	1 42.9 -60.0	149.0	0 51.4 -60.0	149.0	0 00.0 +60.0	31.0	0	0 00.0 +60.0	31.0	0	0 00.0 +60.0	31.0	0		
1	4 59.9 -59.9	148.9	4 08.5 -59.9	148.9	3 17.1 -59.9	148.9	2 25.7 -59.9	149.0	1 34.3 -60.0	149.0	0 42.9 -60.0	149.0	0 08.6 +60.0	31.0	1 00.0 +60.0	31.0	1	2 00.0 +60.0	31.0	2	3 00.0 +60.0	31.0	3		
2	4 00.0 -59.9	148.9	3 08.6 -59.9	149.0	2 17.2 -60.0	149.0	1 25.8 -60.0	149.0	0 34.3 -60.0	149.0	0 25.7 +59.9	31.0	1 17.1 +60.0	31.0	2 08.6 +60.0	31.0	2	3 00.0 +60.0	31.0	3	4 00.0 +60.0	31.0	4		
3	3 00.1 -59.9	149.0	2 08.7 -59.9	149.0	1 17.2 -59.9	149.0	0 25.8 -60.0	149.0	0 17.3 -59.9	149.1	0 34.2 +59.9	30.9	1 25.6 +60.0	30.9	2 17.1 +60.0	30.9	3 08.6 +60.0	31.0	3	4 00.0 +60.0	31.0	4			
4	2 00.2 -59.8	149.1	1 08.8 -59.9	149.1	0 25.8 -60.0	149.1	0 17.3 -59.9	149.1	0 08.9 -59.9	149.1	0 42.6 +60.0	30.9	1 34.1 +60.0	30.9	2 25.6 +60.0	30.9	3 17.1 +60.0	30.9	4 08.6 +60.0	31.0	5	5 00.0 +60.0	31.0	5	
5	1 00.4 -59.9	149.1	0 08.9 -59.9	149.1	0 42.6 +60.0	30.8	1 42.6 +59.9	30.8	3 25.6 +60.0	30.8	4 17.1 +60.0	30.9	5 08.6 +60.0	30.9	6 00.0 +60.0	31.0	6	7 00.0 +60.0	31.0	7					
6	0 00.5 -59.9	149.2	0 51.0 +60.0	30.8	1 42.6 +59.9	30.8	2 34.1 +60.0	30.8	3 25.6 +60.0	30.8	4 17.1 +60.0	30.9	5 08.6 +60.0	30.9	6 00.0 +60.0	31.0	7	7 00.0 +60.0	31.0	8					
7	0 59.4 +59.9	30.7	1 51.0 +59.9	30.8	2 42.5 +60.0	30.8	3 34.1 +59.9	30.8	4 25.6 +60.0	30.8	5 17.1 +60.0	30.9	6 08.6 +60.0	30.9	7 00.0 +60.0	31.0	8	8 00.0 +60.0	31.0	9					
8	1 59.3 +59.9	30.7	2 50.9 +59.9	30.7	3 42.5 +59.9	30.7	4 34.0 +60.0	30.8	5 25.6 +59.9	30.8	6 17.1 +60.0	30.9	7 08.6 +59.9	30.9	8 00.0 +60.0	31.0	9	9 00.0 +60.0	31.0	10					
9	2 59.2 +59.8	30.6	3 50.8 +59.9	30.7	4 42.4 +59.9	30.7	5 34.0 +59.9	30.7	6 25.5 +60.0	30.8	7 17.1 +59.9	30.9	8 08.5 +60.0	30.9	9 00.0 +60.0	31.0	10	10 00.0 +60.0	31.0	11					
10	3 59.0 +59.9	30.6	4 50.7 +59.9	30.6	5 42.3 +60.0	30.6	6 33.9 +60.0	30.7	7 25.5 +60.0	30.8	8 17.0 +60.0	30.8	9 08.5 +60.0	30.9	10 00.0 +60.0	31.0	11	10 00.0 +60.0	31.0	12					
11	4 58.9 +59.9	30.5	5 50.6 +59.9	30.5	6 42.3 +59.9	30.6	7 33.9 +60.0	30.7	8 25.5 +60.0	30.7	9 17.0 +60.0	30.8	10 08.5 +60.0	30.9	11 00.0 +60.0	31.0	12	11 00.0 +60.0	31.0	13					
12	5 58.8 +59.9	30.4	6 50.5 +59.9	30.5	7 42.2 +59.9	30.6	8 33.9 +59.9	30.6	9 25.5 +59.9	30.7	10 17.0 +60.0	30.8	11 08.5 +60.0	30.9	12 00.0 +60.0	31.0	13	12 00.0 +60.0	31.0	14					
13	6 58.7 +59.9	30.4	7 50.4 +59.9	30.4	8 42.1 +60.0	30.5	9 33.8 +60.0	30.6	10 25.4 +60.0	30.7	11 17.0 +60.0	30.8	12 08.5 +60.0	30.9	13 00.0 +60.0	31.0	14	13 00.0 +60.0	31.0	15					
14	7 58.6 +59.8	30.3	8 50.3 +60.0	30.4	9 42.1 +59.9	30.5	10 33.8 +59.9	30.6	11 25.4 +60.0	30.7	12 17.0 +60.0	30.8	13 08.5 +60.0	30.9	14 00.0 +60.0	31.0	15	14 00.0 +60.0	31.0	16					
15	8 58.4 +59.9	30.2	9 50.3 +59.9	30.3	10 42.0 +60.0	30.4	11 33.7 +60.0	30.5	12 25.4 +60.0	30.6	13 17.0 +60.0	30.7	14 08.5 +60.0	30.9	15 00.0 +60.0	31.0	16	15 00.0 +60.0	31.0	17					
16	9 58.3 +59.9	30.2	10 50.2 +59.9	30.3	11 42.0 +59.9	30.4	12 33.7 +60.0	30.5	13 25.4 +60.0	30.6	14 17.0 +60.0	30.7	15 08.5 +60.0	30.9	16 00.0 +60.0	31.0	17	16 00.0 +60.0	31.0	18					
17	10 58.2 +59.9	30.1	11 50.1 +59.9	30.2	12 41.9 +59.9	30.3	13 33.7 +59.9	30.4	14 25.4 +59.9	30.6	15 17.0 +60.0	30.7	16 08.5 +60.0	30.8	17 00.0 +60.0	31.0	18	17 00.0 +60.0	31.0	19					
18	11 58.1 +59.9	30.0	12 50.0 +59.9	30.2	13 41.8 +60.0	30.3	14 33.6 +60.0	30.4	15 25.3 +60.0	30.5	16 17.0 +60.0	30.7	17 08.5 +60.0	30.8	18 00.0 +60.0	31.0	19	18 00.0 +60.0	31.0	20					
19	12 58.0 +59.8	30.0	13 49.9 +59.9	30.1	14 41.8 +59.9	30.2	15 33.6 +59.9	30.4	16 25.3 +60.0	30.5	17 17.0 +59.9	30.7	18 08.5 +60.0	30.8	19 00.0 +60.0	31.0	20	19 00.0 +60.0	31.0	21					
20	13 57.8 +59.9	29.9	14 49.8 +59.9	30.0	15 41.7 +59.9	30.2	16 33.5 +60.0	30.3	17 25.3 +60.0	30.5	18 16.9 +60.0	30.6	19 08.5 +60.0	30.8	20 00.0 +60.0	31.0	21	20 00.0 +60.0	31.0	22					
21	14 57.7 +59.9	29.8	15 49.7 +59.9	30.0	16 41.6 +60.0	30.1	17 33.5 +59.9	30.3	18 25.3 +59.9	30.5	19 16.9 +60.0	30.6	20 08.5 +60.0	30.8	21 00.0 +60.0	31.0	22	21 00.0 +60.0	31.0	23					
22	15 57.6 +59.8	29.8	16 49.6 +59.9	29.9	17 41.6 +59.9	30.1	18 33.4 +60.0	30.2	19 25.2 +60.0	30.4	20 16.9 +60.0	30.6	21 08.5 +60.0	30.8	22 00.0 +60.0	31.0	23	22 00.0 +60.0	31.0	24					
23	16 57.4 +59.9	29.7	17 49.5 +59.9	29.9	18 41.5 +59.9	30.0	19 33.4 +60.0	30.2	20 25.2 +60.0	30.4	21 16.9 +60.0	30.6	22 08.5 +60.0	30.8	23 00.0 +60.0	31.0	24	23 00.0 +60.0	31.0	25					
24	17 57.3 +59.9	29.6	18 49.4 +59.9	29.8	19 41.4 +60.0	30.0	20 33.4 +59.9	30.2	21 25.2 +60.0	30.4	22 16.9 +60.0	30.6	23 08.5 +60.0	30.8	24 00.0 +60.0	31.0	25	24 00.0 +60.0	31.0	26					
25	18 57.2 +59.8	29.6	19 49.3 +59.9	29.7	20 41.4 +59.9	29.9	21 33.3 +60.0	30.1	22 25.2 +59.9	30.3	23 16.9 +60.0	30.5	24 08.5 +60.0	30.8	25 00.0 +60.0	31.0	26	25 00.0 +60.0	31.0	27					
26	19 57.0 +59.9	29.5	20 49.2 +59.9	29.7	21 41.3 +59.9	29.9	22 33.3 +59.9	30.1	23 25.1 +60.0	30.3	24 16.9 +60.0	30.5	25 08.5 +60.0	30.8	26 00.0 +60.0	31.0	27	26 00.0 +60.0	31.0	28					
27	20 56.9 +59.9	29.4	21 49.1 +59.9	29.6	22 41.2 +60.0	29.8	23 33.2 +60.0	30.0	24 25.1 +60.0	30.3	25 16.9 +60.0	30.5	26 08.5 +60.0	30.7	27 00.0 +60.0	31.0	28	27 00.0 +60.0	31.0	29					
28	21 56.8 +59.8	29.4	22 49.0 +59.9	29.6	23 41.2 +59.9	29.8	24 33.2 +59.9	30.0	25 25.1 +60.0	30.2	26 16.9 +59.9	30.5	27 08.5 +60.0	30.7	28 00.0 +60.0	31.0	29	28 00.0 +60.0	31.0	30					
29	22 56.6 +59.9	29.3	23 48.9 +59.9	29.5	24 41.1 +59.9	29.7	25 33.1 +60.0	30.0	26 25.1 +59.9	30.2	27 16.8 +60.0	30.5	28 08.5 +60.0	30.7	29 00.0 +60.0	31.0	31	29 00.0 +60.0	31.0	32					
30	23 56.5 +59.9	29.2	24 48.8 +59.9	29.4	25 41.0 +59.9	29.7	26 33.1 +59.9	29.9	27 25.0 +60.0	30.2	28 16.8 +60.0	30.4	29 08.5 +60.0	30.7	30 00.0 +60.0	31.0	32	30 00.0 +60.0	31.0	33					
31	24 56.4 +59.8	29.1	25 48.7 +59.9	29.4	26 40.9 +60.0	29.6	27 33.0 +60.0	29.9	28 25.0 +60.0	30.1	29 16.8 +60.0	30.4	30 08.5 +60.0	30.7	31 00.0 +60.0	31.0	33	31 00.0 +60.0	31.0	34					
32	25 56.2 +59.9	29.1	26 48.6 +59.9	29.3	27 40.9 +59.9	29.6	28 33.0 +59.9	29.8	29 25.0 +59.9	30.1	30 16.8 +60.0	30.4	31 08.5 +60.0	30.7	32 00.0 +60.0	31.0	33	32 00.0 +60.0	31.0	34					
33	26 56.1 +59.8	29.0	27 48.5 +59.9	29.2	28 40.8 +59.9	29.5	29 32.9 +60.0	29.8	30 24.9 +60.0	30.1	31 16.8 +60.0	30.4	32 08.5 +60.0	30.7	33 00.0 +60.0	31.0	34	33 00.0 +60.0	31.0	35					
34	27 55.9 +59.9	28.9	28 48.4 +59.9	29.2	29 40.7 +59.9	29.4	30 32.9 +59.9	29.7	31 24.9 +60.0	30.0	32 16.8 +60.0	30.3	33 08.5 +60.0	30.7	34 00.0 +60.0	31.0	35	34 00.0 +60.0	31.0	36					
35	28 55.8 +59.8	28.8	29 48.3 +59.8	29.1	30 40.6 +59.9	29.4	31 32.8 +60.0	29.7	32 24.9 +59.9	30.0	33 16.8 +60.0	30.3	34 08.5 +60.0	30.6	35 00.0 +60.0	31.0	36	35 00.0 +60.0	31.0	37					
36	29 55.6 +59.8	28.7	30 48.1 +59.9	29.0	31 40.5 +60.0	29.3	32 32.8 +59.9	29.6	33 24.8 +60.0	29.9	34 16.8 +59.9	30.3	35 08.5 +60.0	30.6	36 00.0 +60.0	31.0	37	36 00.0 +60.0	31.0	38					
37	30 55.4 +59.9	28.7	31 48.0 +59.9	28.9	32 40.5 +59.9	29.3	33 3																		

32°, 328° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° Zn=Z
 L.H.A. less than 180° Zn= 360° -Z

Dec.	83°			84°			85°			86°			87°			88°			89°			90°								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z						
0	5 55.9 +59.9	147.8	5 05.1 +59.9	147.9	4 14.3 +60.0	147.9	3 23.5 +59.9	147.9	2 32.6 +60.0	148.0	1 41.8 +59.9	148.0	0 50.9 +60.0	148.0	0 00.0 +60.0	148.0	0 00.0 +60.0	148.0	0 00.0 +60.0	148.0	0 00.0 +60.0	148.0	0 00.0 +60.0	148.0	0 00.0 +60.0	148.0				
1	6 55.8 +59.9	147.7	6 05.0 +60.0	147.8	5 14.3 +59.9	147.9	4 23.4 +60.0	147.9	3 32.6 +60.0	147.9	2 41.7 +60.0	148.0	1 50.9 +60.0	148.0	1 00.0 +60.0	148.0	1 00.0 +60.0	148.0	1 00.0 +60.0	148.0	1 00.0 +60.0	148.0	1 00.0 +60.0	148.0	1 00.0 +60.0	148.0	1 00.0 +60.0	148.0		
2	7 55.7 +59.8	147.7	7 05.0 +59.9	147.7	6 14.2 +59.9	147.8	5 23.4 +60.0	147.9	4 32.6 +60.0	147.9	3 41.7 +60.0	147.9	2 50.9 +60.0	148.0	2 00.0 +60.0	148.0	2 00.0 +60.0	148.0	2 00.0 +60.0	148.0	2 00.0 +60.0	148.0	2 00.0 +60.0	148.0	2 00.0 +60.0	148.0	2 00.0 +60.0	148.0		
3	8 55.5 +59.9	147.6	8 04.9 +59.9	147.7	7 14.1 +60.0	147.8	6 23.4 +59.9	147.8	5 32.6 +60.0	147.9	4 41.7 +60.0	147.9	3 50.9 +60.0	148.0	3 00.0 +60.0	148.0	3 00.0 +60.0	148.0	3 00.0 +60.0	148.0	3 00.0 +60.0	148.0	3 00.0 +60.0	148.0	3 00.0 +60.0	148.0	3 00.0 +60.0	148.0		
4	9 55.4 +59.9	147.5	9 04.8 +59.9	147.6	8 14.1 +59.9	147.7	7 23.3 +60.0	147.8	6 32.5 +60.0	147.9	5 41.7 +60.0	147.9	4 50.9 +60.0	148.0	4 00.0 +60.0	148.0	4 00.0 +60.0	148.0	4 00.0 +60.0	148.0	4 00.0 +60.0	148.0	4 00.0 +60.0	148.0	4 00.0 +60.0	148.0	4 00.0 +60.0	148.0		
5	10 55.3 +59.9	147.5	10 04.7 +59.9	147.6	9 14.0 +59.9	147.7	8 23.3 +59.9	147.7	7 32.5 +60.0	147.8	6 41.7 +60.0	147.9	5 50.9 +60.0	147.9	5 00.0 +60.0	148.0	5 00.0 +60.0	148.0	5 00.0 +60.0	148.0	5 00.0 +60.0	148.0	5 00.0 +60.0	148.0	5 00.0 +60.0	148.0	5 00.0 +60.0	148.0		
6	11 55.2 +59.8	147.4	11 04.6 +59.9	147.5	10 13.9 +60.0	147.6	9 23.2 +60.0	147.7	8 32.5 +60.0	147.8	7 41.7 +60.0	147.9	6 50.9 +60.0	147.9	6 00.0 +60.0	148.0	6 00.0 +60.0	148.0	6 00.0 +60.0	148.0	6 00.0 +60.0	148.0	6 00.0 +60.0	148.0	6 00.0 +60.0	148.0	6 00.0 +60.0	148.0		
7	12 55.0 +59.9	147.3	12 04.5 +59.9	147.5	11 13.9 +59.9	147.6	10 23.2 +60.0	147.7	9 32.5 +59.9	147.8	8 41.7 +60.0	147.9	7 50.9 +60.0	147.9	7 00.0 +60.0	148.0	7 00.0 +60.0	148.0	7 00.0 +60.0	148.0	7 00.0 +60.0	148.0	7 00.0 +60.0	148.0	7 00.0 +60.0	148.0	7 00.0 +60.0	148.0		
8	13 54.9 +59.9	147.3	13 04.4 +59.9	147.4	12 13.8 +59.9	147.5	11 23.2 +59.9	147.6	10 32.4 +60.0	147.7	9 41.7 +60.0	147.8	8 50.9 +60.0	147.8	8 00.0 +60.0	148.0	8 00.0 +60.0	148.0	8 00.0 +60.0	148.0	8 00.0 +60.0	148.0	8 00.0 +60.0	148.0	8 00.0 +60.0	148.0	8 00.0 +60.0	148.0		
9	14 54.8 +59.8	147.2	14 03.4 +59.9	147.3	13 13.7 +60.0	147.5	12 23.1 +60.0	147.6	11 32.4 +60.0	147.7	10 41.7 +60.0	147.8	9 50.9 +60.0	147.9	9 00.0 +60.0	148.0	9 00.0 +60.0	148.0	9 00.0 +60.0	148.0	9 00.0 +60.0	148.0	9 00.0 +60.0	148.0	9 00.0 +60.0	148.0	9 00.0 +60.0	148.0		
10	15 54.6 +59.9	147.1	15 04.2 +59.9	147.3	14 13.7 +59.9	147.4	13 23.1 +59.9	147.6	12 32.4 +60.0	147.7	11 41.7 +59.9	147.8	10 50.9 +60.0	147.9	10 00.0 +60.0	148.0	10 00.0 +60.0	148.0	10 00.0 +60.0	148.0	10 00.0 +60.0	148.0	10 00.0 +60.0	148.0	10 00.0 +60.0	148.0	10 00.0 +60.0	148.0		
11	16 54.5 +59.9	147.1	16 04.1 +59.9	147.2	15 13.6 +59.9	147.4	14 23.0 +60.0	147.5	13 32.5 +59.9	147.5	12 41.6 +60.0	147.8	11 50.9 +60.0	147.9	11 00.0 +60.0	148.0	11 00.0 +60.0	148.0	11 00.0 +60.0	148.0	11 00.0 +60.0	148.0	11 00.0 +60.0	148.0	11 00.0 +60.0	148.0	11 00.0 +60.0	148.0		
12	17 54.4 +59.8	147.0	17 04.0 +59.9	147.2	16 13.5 +60.0	147.3	15 23.0 +59.9	147.5	14 32.3 +60.0	147.6	13 41.6 +60.0	147.8	12 50.9 +59.9	147.9	12 00.0 +60.0	148.0	12 00.0 +60.0	148.0	12 00.0 +60.0	148.0	12 00.0 +60.0	148.0	12 00.0 +60.0	148.0	12 00.0 +60.0	148.0	12 00.0 +60.0	148.0		
13	18 54.2 +59.9	146.9	18 03.9 +59.9	147.1	17 13.5 +59.9	147.3	16 22.9 +60.0	147.4	15 32.3 +60.0	147.6	14 41.6 +60.0	147.7	13 50.8 +60.0	147.9	13 00.0 +60.0	148.0	13 00.0 +60.0	148.0	13 00.0 +60.0	148.0	13 00.0 +60.0	148.0	13 00.0 +60.0	148.0	13 00.0 +60.0	148.0	13 00.0 +60.0	148.0		
14	19 54.1 +59.8	146.8	19 03.8 +59.9	147.0	18 13.4 +59.9	147.2	17 22.9 +59.9	147.4	16 32.3 +60.0	147.6	15 40.8 +60.0	147.7	14 50.8 +60.0	147.9	14 00.0 +60.0	148.0	14 00.0 +60.0	148.0	14 00.0 +60.0	148.0	14 00.0 +60.0	148.0	14 00.0 +60.0	148.0	14 00.0 +60.0	148.0	14 00.0 +60.0	148.0		
15	20 53.9 +59.9	146.8	20 03.7 +59.9	147.0	19 13.3 +59.9	147.2	18 22.8 +60.0	147.4	17 32.3 +59.9	147.5	16 41.6 +60.0	147.7	15 50.8 +60.0	147.9	15 00.0 +60.0	148.0	15 00.0 +60.0	148.0	15 00.0 +60.0	148.0	15 00.0 +60.0	148.0	15 00.0 +60.0	148.0	15 00.0 +60.0	148.0	15 00.0 +60.0	148.0	15 00.0 +60.0	148.0
16	21 53.8 +59.8	146.7	21 03.6 +59.9	146.9	20 13.2 +60.0	147.1	19 22.8 +60.0	147.3	18 32.2 +60.0	147.5	17 41.6 +60.0	147.7	16 50.8 +60.0	147.8	16 00.0 +60.0	148.0	16 00.0 +60.0	148.0	16 00.0 +60.0	148.0	16 00.0 +60.0	148.0	16 00.0 +60.0	148.0	16 00.0 +60.0	148.0	16 00.0 +60.0	148.0	16 00.0 +60.0	148.0
17	22 53.6 +59.9	146.6	22 03.5 +59.9	146.9	21 13.2 +59.9	147.1	20 22.8 +59.9	147.3	19 32.2 +60.0	147.5	18 41.6 +60.0	147.7	17 50.8 +60.0	147.8	17 00.0 +60.0	148.0	17 00.0 +60.0	148.0	17 00.0 +60.0	148.0	17 00.0 +60.0	148.0	17 00.0 +60.0	148.0	17 00.0 +60.0	148.0	17 00.0 +60.0	148.0	17 00.0 +60.0	148.0
18	23 53.5 +59.8	146.5	23 03.4 +59.9	146.8	22 13.1 +59.9	147.0	21 22.7 +60.0	147.2	20 32.2 +60.0	147.4	19 41.6 +60.0	147.6	18 50.8 +60.0	147.8	18 00.0 +60.0	148.0	18 00.0 +60.0	148.0	18 00.0 +60.0	148.0	18 00.0 +60.0	148.0	18 00.0 +60.0	148.0	18 00.0 +60.0	148.0	18 00.0 +60.0	148.0	18 00.0 +60.0	148.0
19	24 53.3 +59.9	146.5	24 03.3 +59.9	146.7	23 13.0 +59.9	147.0	22 22.7 +59.9	147.2	21 32.2 +60.0	147.4	20 41.6 +59.9	147.6	19 50.8 +60.0	147.8	19 00.0 +60.0	148.0	19 00.0 +60.0	148.0	19 00.0 +60.0	148.0	19 00.0 +60.0	148.0	19 00.0 +60.0	148.0	19 00.0 +60.0	148.0	19 00.0 +60.0	148.0	19 00.0 +60.0	148.0
20	25 53.2 +59.8	146.4	25 03.1 +59.9	146.7	24 12.9 +60.0	146.9	23 22.6 +60.0	147.1	22 32.1 +60.0	147.4	21 41.5 +60.0	147.6	20 50.8 +60.0	147.8	20 00.0 +60.0	148.0	20 00.0 +60.0	148.0	20 00.0 +60.0	148.0	20 00.0 +60.0	148.0	20 00.0 +60.0	148.0	20 00.0 +60.0	148.0	20 00.0 +60.0	148.0	20 00.0 +60.0	148.0
21	26 53.0 +59.9	146.3	26 03.0 +59.9	146.6	25 12.9 +59.9	146.9	24 22.6 +59.9	147.1	23 32.1 +60.0	147.3	22 41.5 +60.0	147.6	21 50.8 +60.0	147.8	21 00.0 +60.0	148.0	21 00.0 +60.0	148.0	21 00.0 +60.0	148.0	21 00.0 +60.0	148.0	21 00.0 +60.0	148.0	21 00.0 +60.0	148.0	21 00.0 +60.0	148.0	21 00.0 +60.0	148.0
22	27 52.9 +59.8	146.2	27 02.9 +59.9	146.4	26 12.8 +59.9	146.8	25 22.5 +60.0	147.1	24 32.1 +60.0	147.3	23 41.5 +60.0	147.6	22 50.8 +60.0	147.8	22 00.0 +60.0	148.0	22 00.0 +60.0	148.0	22 00.0 +60.0	148.0	22 00.0 +60.0	148.0	22 00.0 +60.0	148.0	22 00.0 +60.0	148.0	22 00.0 +60.0	148.0	22 00.0 +60.0	148.0
23	28 52.7 +59.8	146.1	28 02.8 +59.9	146.4	27 12.7 +59.9	146.7	26 22.5 +59.9	147.0	25 32.1 +60.0	147.3	24 41.5 +60.0	147.5	23 50.8 +60.0	147.7	23 00.0 +60.0	148.0	23 00.0 +60.0	148.0	23 00.0 +60.0	148.0	23 00.0 +60.0	148.0	23 00.0 +60.0	148.0	23 00.0 +60.0	148.0	23 00.0 +60.0	148.0	23 00.0 +60.0	148.0
24	29 52.5 +59.9	146.1	29 02.7 +59.9	146.4	28 12.6 +59.9	146.7	27 22.4 +60.0	147.0	26 32.0 +60.0	147.2	25 41.5 +60.0	147.5	24 50.8 +60.0	147.7	24 00.0 +60.0	148.0	24 00.0 +60.0	148.0	24 00.0 +60.0	148.0	24 00.0 +60.0	148.0	24 00.0 +60.0	148.0	24 00.0 +60.0	148.0	24 00.0 +60.0	148.0	24 00.0 +60.0	148.0
25	30 52.4 +59.8	146.0	30 02.6 +59.8	146.3	29 12.5 +59.8	146.4	28 22.4 +59.8	146.9	27 32.0 +60.0	147.2	26 41.5 +60.0	147.5	25 50.8 +60.0	147.8	25 00.0 +60.0	148.0	25 00.0 +60.0	148.0	25 00.0 +60.0	148.0	25 00.0 +60.0	148.0	25 00.0 +60.0	148.0	25 00.0 +60.0	148.0	25 00.0 +60.0	148.0	25 00.0 +60.0	148.0
26	31 52.2 +59.8	145.9	31 02.4 +59.9	145.9	30 12.5 +59.9	146.4	29 22.3 +59.9	146.9	28 32.0 +60.0	147.2	27 41.5 +60.0	147.5	26 50.8 +60.0	147.8	26 00.0 +60.0	148.0	26 00.0 +60.0	148.0	26 00.0 +60.0	148.0	26 00.0 +60.0	148.0	26 00.0 +60.0	148.0	26 00.0 +60.0	148.0	26 00.0 +60.0	148.0	26 00.0 +60.0	148.0
27	32 52.0 +59.8	145.8	32 02.3 +59.9	146.2	31 12.4 +59.9	146.5	30 22.2 +60.0	146.8	29 31.9 +60.0	147.1	28 41.5 +60.0	147.4	27 50.8 +60.0	147.7	27 00.0 +60.0	148.0	27 00.0 +60.0	148.0	27 00.0 +60.0	148.0	27 00.0 +60.0	148.0	27 00.0 +60.0	148.0	27 00.0 +60.0	148.0	27 00.0 +60.0	148.0	27 00.0 +60.0	148.0
28	33 51.8 +59.9	145.7	33 02.2 +59.8	146.1	32 12.3 +59.8	146.3	31 22.2 +59.8	146.4	30 31.9 +60.0	146.8	29 41.4 +60.0																			

32°, 328° L.H.A.

LATITUDE SAME NAME AS DECLINATION

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 32°, 328°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	5 55.9 -59.8	147.8	5 05.1 -59.9	147.9	4 14.3 -59.9	147.9	3 23.5 -60.0	147.9	2 32.6 -59.9	148.0	1 41.8 -60.0	148.0	0 50.9 -60.0	148.0	0 00.0 +60.0	32.0	0 00.0 +60.0	32.0	0 00.0 +60.0	32.0	0 00.0 +60.0	32.0	0 00.0 +60.0	32.0	0
1	4 56.1 -59.9	147.9	4 05.2 -59.9	147.9	3 14.4 -59.9	147.9	2 23.5 -59.9	148.0	1 32.7 -60.0	148.0	0 41.8 -60.0	148.0	0 09.1 +60.0	32.0	1 00.0 +60.0	32.0	2 00.0 +60.0	32.0	2 00.0 +60.0	32.0	2 00.0 +60.0	32.0	1		
2	3 56.2 -59.9	147.9	3 05.3 -59.9	148.0	2 14.5 -60.0	148.0	1 23.6 -60.0	148.0	0 32.7 -60.0	148.0	0 18.2 +60.0	32.0	1 19.1 +60.0	32.0	2 09.1 +60.0	32.0	3 00.0 +60.0	32.0	3 00.0 +60.0	32.0	3 00.0 +60.0	32.0	2		
3	2 56.3 -59.9	148.0	2 05.4 -59.9	148.0	1 14.5 -59.9	148.0	0 23.6 -60.0	148.0	0 36.4 +59.9	31.9	1 27.3 +60.0	31.9	2 18.2 +60.0	31.9	3 09.1 +60.0	32.0	4 00.0 +60.0	32.0	4 00.0 +60.0	32.0	4 00.0 +60.0	32.0	3		
4	1 56.4 -59.8	148.1	1 05.5 -59.9	148.1	0 14.6 -60.0	148.1	0 45.4 +59.9	31.9	1 36.3 +60.0	31.9	2 27.3 +59.9	31.9	3 18.2 +60.0	31.9	4 09.1 +60.0	32.0	5 00.0 +60.0	32.0	5 00.0 +60.0	32.0	5 00.0 +60.0	32.0	4		
5	0 56.6 -59.9	148.1	0 05.6 -59.9	148.1	0 45.4 +59.9	31.8	1 45.3 +59.9	31.8	2 36.3 +59.9	31.8	3 27.2 +60.0	31.8	4 18.2 +60.0	31.9	5 09.1 +60.0	31.9	6 00.0 +60.0	32.0	6 00.0 +60.0	32.0	6 00.0 +60.0	32.0	5		
6	0 03.3 +59.9	31.8	0 54.3 +59.9	31.8	1 45.3 +59.9	31.8	2 36.3 +59.9	31.8	3 27.2 +60.0	31.8	4 18.2 +60.0	31.9	5 09.1 +60.0	31.9	6 00.0 +60.0	32.0	7 00.0 +60.0	32.0	7 00.0 +60.0	32.0	7 00.0 +60.0	32.0	6		
7	1 03.2 +59.9	31.7	1 54.2 +59.9	31.8	2 45.2 +60.0	31.8	3 36.2 +60.0	31.8	4 27.2 +60.0	31.8	5 18.2 +60.0	31.9	6 09.1 +60.0	31.9	7 09.1 +60.0	31.9	8 00.0 +60.0	32.0	8 00.0 +60.0	32.0	8 00.0 +60.0	32.0	8		
8	2 03.1 +59.8	31.7	2 54.1 +59.9	31.7	3 45.2 +59.9	31.7	4 36.2 +59.9	31.8	5 27.2 +60.0	31.8	6 18.2 +59.9	31.9	7 09.1 +60.0	31.9	8 00.0 +60.0	32.0	9 00.0 +60.0	32.0	9 00.0 +60.0	32.0	9 00.0 +60.0	32.0	9		
9	3 02.9 +59.9	31.6	3 54.0 +59.9	31.6	4 45.1 +59.9	31.7	5 36.1 +60.0	31.7	6 27.2 +59.9	31.8	7 18.1 +60.0	31.8	8 09.1 +60.0	31.9	9 00.0 +60.0	32.0	10 00.0 +60.0	32.0	10 00.0 +60.0	32.0	10 00.0 +60.0	32.0	10		
10	4 02.8 +59.9	31.5	4 53.9 +59.9	31.6	5 45.0 +60.0	31.6	6 36.1 +60.0	31.7	7 27.1 +60.0	31.8	8 18.1 +60.0	31.8	9 09.1 +60.0	31.9	10 00.0 +60.0	32.0	11 00.0 +60.0	32.0	11 00.0 +60.0	32.0	11 00.0 +60.0	32.0	11		
11	5 02.7 +59.9	31.5	5 53.8 +60.0	31.5	6 45.0 +59.9	31.6	7 36.1 +59.9	31.7	8 27.1 +60.0	31.7	9 18.1 +60.0	31.8	10 09.1 +60.0	31.9	11 00.0 +60.0	32.0	12 00.0 +60.0	32.0	12 00.0 +60.0	32.0	12 00.0 +60.0	32.0	12		
12	6 02.6 +59.8	31.4	6 53.8 +59.9	31.5	7 44.9 +59.9	31.5	8 36.0 +60.0	31.6	9 27.1 +60.0	31.7	10 18.1 +60.0	31.8	11 09.1 +60.0	31.9	12 09.1 +60.0	32.0	13 00.0 +60.0	32.0	13 00.0 +60.0	32.0	13 00.0 +60.0	32.0	13		
13	7 02.4 +59.9	31.3	7 53.7 +59.9	31.4	8 44.8 +60.0	31.5	9 36.0 +59.9	31.6	10 27.1 +59.9	31.7	11 18.1 +60.0	31.8	12 09.1 +60.0	31.9	13 09.1 +60.0	32.0	14 00.0 +60.0	32.0	14 00.0 +60.0	32.0	14 00.0 +60.0	32.0	14		
14	8 02.3 +59.9	31.3	8 53.6 +59.9	31.4	9 44.8 +59.9	31.4	10 35.9 +60.0	31.5	11 27.0 +60.0	31.6	12 18.1 +60.0	31.8	13 09.1 +60.0	31.9	14 00.0 +60.0	32.0	15 00.0 +60.0	32.0	15 00.0 +60.0	32.0	15 00.0 +60.0	32.0	15		
15	9 02.2 +59.8	31.2	9 53.5 +59.9	31.3	10 44.7 +59.9	31.4	11 35.9 +60.0	31.5	12 27.0 +60.0	31.6	13 18.1 +60.0	31.7	14 09.1 +60.0	31.9	15 00.0 +60.0	32.0	16 00.0 +60.0	32.0	16 00.0 +60.0	32.0	16 00.0 +60.0	32.0	16		
16	10 02.0 +59.9	31.2	10 53.4 +59.9	31.2	11 44.6 +60.0	31.4	12 35.9 +59.9	31.5	13 27.0 +60.0	31.6	14 18.1 +60.0	31.7	15 09.1 +60.0	31.9	16 00.0 +60.0	32.0	17 00.0 +60.0	32.0	17 00.0 +60.0	32.0	17 00.0 +60.0	32.0	17		
17	11 01.9 +59.9	31.1	11 53.3 +59.9	31.2	12 44.6 +59.9	31.3	13 35.8 +60.0	31.4	14 27.0 +59.9	31.6	15 18.1 +60.0	31.7	16 09.1 +60.0	31.8	17 00.0 +60.0	32.0	18 00.0 +60.0	32.0	18 00.0 +60.0	32.0	18 00.0 +60.0	32.0	18		
18	12 01.8 +59.9	31.0	12 53.2 +59.9	31.1	13 44.5 +59.9	31.3	14 35.8 +60.0	31.4	15 26.9 +60.0	31.5	16 18.1 +59.9	31.7	17 09.1 +60.0	31.8	18 00.0 +60.0	32.0	19 00.0 +60.0	32.0	19 00.0 +60.0	32.0	19 00.0 +60.0	32.0	19		
19	13 01.7 +59.8	30.9	13 53.1 +59.9	31.1	14 44.4 +60.0	31.2	15 35.7 +60.0	31.3	16 26.9 +60.0	31.5	17 18.0 +60.0	31.7	18 09.1 +60.0	31.8	19 00.0 +60.0	32.0	20 00.0 +60.0	32.0	20 00.0 +60.0	32.0	20 00.0 +60.0	32.0	20		
20	14 01.5 +59.9	30.9	14 53.0 +59.9	31.0	15 44.4 +59.9	31.2	16 35.7 +59.9	31.3	17 26.9 +60.0	31.5	18 18.0 +60.0	31.6	19 09.1 +60.0	31.8	20 00.0 +60.0	32.0	21 00.0 +60.0	32.0	21 00.0 +60.0	32.0	21 00.0 +60.0	32.0	21		
21	15 01.4 +59.9	30.8	15 52.9 +59.9	31.0	16 44.3 +59.9	31.1	17 35.6 +60.0	31.3	18 26.9 +59.9	31.4	19 18.0 +60.0	31.6	20 09.1 +60.0	31.8	21 00.0 +60.0	32.0	22 00.0 +60.0	32.0	22 00.0 +60.0	32.0	22 00.0 +60.0	32.0	22		
22	16 01.3 +59.8	30.7	16 52.8 +59.9	30.9	17 44.2 +60.0	31.1	18 35.6 +59.9	31.2	19 26.8 +60.0	31.4	20 18.0 +60.0	31.6	21 09.1 +60.0	31.8	22 09.1 +60.0	32.0	23 00.0 +60.0	32.0	23 00.0 +60.0	32.0	23 00.0 +60.0	32.0	23		
23	17 01.1 +59.9	30.7	17 52.7 +59.9	30.8	18 44.2 +59.9	31.0	19 35.5 +60.0	31.2	20 26.8 +60.0	31.4	21 18.0 +60.0	31.6	22 09.1 +60.0	31.8	23 00.0 +60.0	32.0	24 00.0 +60.0	32.0	24 00.0 +60.0	32.0	24 00.0 +60.0	32.0	24		
24	18 01.0 +59.8	30.6	18 52.6 +59.9	30.8	19 44.1 +59.9	31.0	20 35.5 +60.0	31.1	21 26.8 +60.0	31.3	22 18.0 +60.0	31.5	23 09.1 +59.9	31.8	24 00.0 +60.0	32.0	25 00.0 +60.0	32.0	25 00.0 +60.0	32.0	25 00.0 +60.0	32.0	25		
25	19 00.8 +59.9	30.5	19 52.5 +59.9	30.7	20 44.0 +59.9	30.9	21 35.4 +60.0	30.8	22 26.8 +59.9	31.3	23 18.0 +60.0	31.5	24 09.0 +60.0	31.8	25 00.0 +60.0	32.0	26 00.0 +60.0	32.0	26 00.0 +60.0	32.0	26 00.0 +60.0	32.0	26		
26	20 00.7 +59.9	30.5	20 52.4 +59.9	30.6	21 43.9 +60.0	30.8	22 35.4 +59.9	31.1	23 26.7 +60.0	31.3	24 18.0 +59.9	31.5	25 09.0 +60.0	31.7	26 00.0 +60.0	32.0	27 00.0 +60.0	32.0	27 00.0 +60.0	32.0	27 00.0 +60.0	32.0	27		
27	21 00.6 +59.8	30.4	21 52.3 +59.9	30.6	22 43.9 +59.9	30.8	23 35.3 +60.0	31.0	24 26.7 +60.0	31.2	25 17.9 +60.0	31.5	26 09.0 +60.0	31.7	27 00.0 +60.0	32.0	28 00.0 +60.0	32.0	28 00.0 +60.0	32.0	28 00.0 +60.0	32.0	28		
28	22 00.4 +59.9	30.3	22 52.2 +59.9	30.5	23 43.8 +59.9	30.7	24 35.3 +59.9	30.9	25 26.7 +60.0	31.0	26 17.9 +60.0	31.3	27 09.0 +60.0	31.7	28 00.0 +60.0	32.0	29 00.0 +60.0	32.0	29 00.0 +60.0	32.0	29 00.0 +60.0	32.0	29		
29	23 00.3 +59.8	30.2	23 52.1 +59.8	30.5	24 43.7 +59.9	30.7	25 35.2 +60.0	30.9	26 26.7 +59.9	31.2	27 17.9 +60.0	31.4	28 09.0 +60.0	31.6	29 00.0 +60.0	32.0	30 00.0 +60.0	32.0	30 00.0 +60.0	32.0	30 00.0 +60.0	32.0	30		
30	24 00.1 +59.9	30.2	24 51.9 +59.9	30.4	25 43.6 +60.0	30.6	26 35.2 +59.9	30.9	27 26.6 +60.0	31.1	28 17.9 +60.0	31.4	29 09.0 +60.0	31.7	30 00.0 +60.0	32.0	31 00.0 +60.0	32.0	31 00.0 +60.0	32.0	31 00.0 +60.0	32.0	30		
31	25 00.0 +59.8	30.1	25 51.8 +59.9	30.3	26 43.6 +59.9	30.6	27 35.1 +60.0	30.8	28 26.6 +60.0	31.1	29 17.9 +60.0	31.4	30 09.0 +60.0	31.7	31 00.0 +60.0	32.0	32 00.0 +60.0	32.0	32 00.0 +60.0	32.0	32 00.0 +60.0	32.0	31		
32	25 59.8 +59.9	30.0	26 51.7 +59.9	30.2	27 43.5 +59.9	30.5	28 35.1 +59.9	30.8	29 26.6 +5																

33°, 327° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° Zn=Z
 L.H.A. less than 180° Zn= 360° -Z

Dec.	83°			84°			85°			86°			87°			88°			89°			Dec.			
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z				
0	5	52.0	+59.8	146.8	5	01.8	+59.9	146.9	4	11.5	+59.9	146.9	3	21.2	+60.0	146.9	2	30.9	+60.0	147.0	1	40.6	+60.0	147.0	0
1	6	51.8	+59.9	146.7	6	01.7	+59.9	146.8	5	11.4	+60.0	146.9	4	21.2	+59.9	146.9	3	30.9	+60.0	146.9	2	40.6	+60.0	147.0	1
2	7	51.7	+59.9	146.7	7	01.6	+59.9	146.7	6	11.4	+59.9	146.8	5	21.1	+60.0	146.9	4	30.9	+60.0	146.9	3	40.6	+60.0	147.0	2
3	8	51.6	+59.8	146.6	8	01.5	+59.9	146.7	7	11.3	+59.9	146.8	6	21.1	+60.0	146.8	5	30.9	+59.9	146.9	4	40.6	+60.0	146.9	3
4	9	51.4	+59.9	146.5	9	01.4	+59.9	146.6	8	11.2	+60.0	146.7	7	21.1	+59.9	146.8	6	30.8	+60.0	146.8	5	40.6	+60.0	146.9	4
5	10	51.3	+59.9	146.5	10	01.3	+59.9	146.6	9	11.2	+59.9	146.7	8	21.0	+60.0	146.7	7	30.8	+60.0	146.8	6	40.6	+60.0	146.9	5
6	11	51.2	+59.8	146.4	11	01.2	+59.9	146.5	10	11.1	+59.9	146.6	9	21.0	+59.9	146.7	8	30.8	+60.0	146.8	7	40.6	+60.0	146.9	6
7	12	51.0	+59.9	146.3	12	01.1	+59.9	146.4	11	11.0	+60.0	146.6	10	20.9	+60.0	146.7	9	30.8	+59.9	146.8	8	40.6	+59.9	146.8	7
8	13	50.9	+59.8	146.3	13	01.0	+59.9	146.4	12	11.0	+59.9	146.5	11	20.9	+59.9	146.6	10	30.7	+60.0	146.7	9	40.5	+60.0	146.8	8
9	14	50.7	+59.9	146.2	14	00.9	+59.9	146.3	13	10.9	+59.9	146.5	12	20.8	+60.0	146.6	11	30.7	+60.0	146.7	10	40.5	+60.0	146.8	9
10	15	50.6	+59.9	146.1	15	00.8	+59.8	146.3	14	10.8	+59.9	146.4	13	20.8	+59.9	146.5	12	30.7	+60.0	146.7	11	40.5	+60.0	146.8	10
11	16	50.5	+59.8	146.0	16	00.6	+59.9	146.2	15	10.7	+60.0	146.4	14	20.7	+60.0	146.5	13	30.7	+59.9	146.6	12	40.5	+60.0	146.8	11
12	17	50.3	+59.9	146.0	17	00.5	+59.9	146.1	16	10.7	+59.9	146.3	15	20.7	+59.9	146.5	14	30.6	+60.0	146.6	13	40.5	+60.0	146.8	12
13	18	50.2	+59.8	145.9	18	00.4	+59.9	146.1	17	10.6	+59.9	146.3	16	20.6	+60.0	146.4	15	30.6	+60.0	146.6	14	40.5	+60.0	146.9	13
14	19	50.0	+59.9	145.8	19	00.3	+59.9	146.0	18	10.5	+59.9	146.2	17	20.6	+60.0	146.4	16	30.6	+60.0	146.6	15	40.5	+60.0	146.9	14
15	20	49.9	+59.8	145.7	20	00.2	+59.9	146.0	19	10.4	+60.0	146.2	18	20.6	+59.9	146.3	17	30.6	+59.9	146.5	16	40.5	+60.0	146.7	15
16	21	49.7	+59.9	145.7	21	00.1	+59.9	145.9	20	10.4	+59.9	146.1	19	20.5	+60.0	146.3	18	30.5	+60.0	146.5	17	40.5	+59.9	146.7	16
17	22	49.6	+59.8	145.6	22	00.0	+59.9	145.8	21	10.3	+59.9	146.0	20	20.5	+59.9	146.3	19	30.5	+60.0	146.5	18	40.4	+60.0	146.6	17
18	23	49.4	+59.8	145.5	23	59.9	+59.9	145.8	22	10.2	+59.9	146.0	21	20.4	+60.0	146.2	20	30.5	+60.0	146.4	19	40.4	+60.0	146.8	18
19	24	49.2	+59.9	145.4	23	59.8	+59.8	145.7	23	10.1	+59.9	145.9	22	20.4	+59.9	146.2	21	30.5	+59.9	146.4	20	40.4	+60.0	146.6	19
20	25	49.1	+59.8	145.4	24	59.6	+59.9	145.6	24	10.0	+60.0	145.9	23	20.3	+60.0	146.1	22	30.4	+60.0	146.4	21	40.4	+60.0	146.8	20
21	26	48.9	+59.9	145.3	25	59.5	+59.9	145.6	25	10.0	+59.9	145.8	24	20.3	+59.9	146.1	23	30.4	+60.0	146.3	22	40.4	+60.0	146.6	21
22	27	48.8	+59.8	145.2	26	59.4	+59.9	145.5	26	09.9	+59.9	145.8	25	20.2	+59.9	146.0	24	30.4	+59.9	146.3	23	40.3	+60.0	146.6	22
23	28	48.6	+59.8	145.1	27	59.3	+59.9	145.4	27	09.8	+59.9	145.7	26	20.1	+60.0	146.0	25	30.3	+60.0	146.3	24	40.4	+60.0	146.5	23
24	29	48.4	+59.8	145.0	28	59.2	+59.8	145.3	28	09.7	+59.9	145.6	27	20.1	+59.9	145.9	26	30.3	+60.0	146.2	25	40.4	+59.9	146.5	24
25	30	48.2	+59.8	144.9	29	59.0	+59.9	145.3	29	09.6	+59.9	145.6	28	20.0	+60.0	145.9	27	30.3	+59.9	146.2	26	40.3	+60.0	146.5	25
26	31	48.0	+59.9	144.8	30	58.9	+59.9	145.2	30	09.5	+59.9	145.5	29	20.0	+59.9	145.8	28	30.2	+60.0	146.1	27	40.3	+60.0	146.4	26
27	32	47.9	+59.8	144.7	31	58.8	+59.8	145.1	31	09.4	+60.0	145.5	30	19.9	+60.0	145.8	29	30.2	+60.0	146.1	28	40.3	+60.0	146.4	27
28	33	47.7	+59.8	144.6	32	58.6	+59.9	145.0	32	09.4	+59.9	145.4	31	19.9	+59.9	145.7	30	30.2	+59.9	146.1	29	40.3	+60.0	146.4	28
29	34	47.5	+59.8	144.5	33	58.5	+59.8	144.9	33	09.3	+59.9	145.3	32	19.8	+59.9	145.7	31	30.1	+60.0	146.0	30	40.3	+60.0	146.4	29
30	35	47.3	+59.8	144.4	34	58.3	+59.9	144.9	34	09.2	+59.9	145.3	33	19.7	+60.0	145.6	32	30.1	+60.0	146.0	31	40.3	+60.0	146.3	30
31	36	47.1	+59.8	144.3	35	58.2	+59.8	144.8	35	09.1	+59.9	145.2	34	19.7	+59.9	145.6	33	30.1	+59.9	146.0	32	40.3	+59.9	146.3	31
32	37	46.9	+59.8	144.2	36	58.0	+59.9	144.7	36	09.0	+59.9	145.1	35	19.6	+60.0	145.5	34	30.0	+60.0	145.9	33	40.2	+60.0	146.2	32
33	38	46.7	+59.7	144.1	37	57.9	+59.8	144.6	37	08.9	+59.8	145.0	36	19.6	+59.9	145.5	35	30.0	+60.0	146.0	34	40.2	+60.0	146.3	33
34	39	46.4	+59.8	144.0	38	57.7	+59.9	144.5	38	08.7	+59.8	145.0	37	19.5	+59.9	145.4	36	30.0	+59.9	145.8	35	40.2	+60.0	146.6	34
35	40	46.2	+59.8	143.9	39	57.6	+59.8	144.4	39	08.6	+59.9	144.9	38	19.4	+59.9	145.3	37	29.8	+60.0	145.8	36	40.2	+60.0	146.2	35
36	41	46.0	+59.7	143.8	40	57.4	+59.8	144.3	40	08.5	+59.9	144.8	39	19.3	+60.0	145.3	38	29.8	+59.9	145.7	37	40.2	+60.0	146.6	36
37	42	45.7	+59.8	143.7	41	57.2	+59.8	144.2	41	08.4	+59.9	144.7	40	19.3	+59.9	145.2	39	29.8	+60.0	145.7	38	40.2	+59.9	146.4	37
38	43	45.5	+59.7	143.5	42	57.0	+59.9	144.1	42	08.3	+59.9	144.6	41	19.2	+59.9	145.1	40	29.8	+60.0	145.6	39	40.2	+60.0	146.3	38
39	44	45.2	+59.8	143.4	43	56.9	+59.8	144.0	43	08.2	+59.8	144.5	42	19.1	+59.9	145.1	41	29.8	+59.9	145.6	40	40.1	+60.0	146.5	39
40	45	45.0	+59.7	143.3	44	56.7	+59.8	143.9	44	08.0	+59.9	144.4	43	19.0	+60.0	145.0	42	29.7	+60.0	145.5	41	40.1	+60.0	146.0	40
41	46	44.7	+59.7	143.1	45	56.5	+59.8	143.6	46	07.8	+59.8	144.3	45	18.9	+59.9	144.9	44	29.6	+60.0	145.4	43	40.1	+59.9	146.0	41
42	47	44.4	+59.7	143.0	46	56.3	+59.8	143.6	46	07.8	+59.8	144.3	45	18.8	+59.9	144.8	44	29.6	+60.0	145.4	43	40.1	+60.0	146.7	42
43	48	44.1	+59.7	142.8	47	56.1	+59.7	143.5	47	07.6	+59.9	144.2	46	18.8	+59.9	144.8	45	29.6	+59.9	145.4	44	40.0	+60.0	146.5	43
44	49	43.8	+59.7	142.7	48	55.8	+59.8	143.4	48	07.5	+59.8	144.1	47	18.7	+59.9	144.7	46	29.5	+60.0	145.3	45	40.0	+60.0	146.4	44
45	50	43.5	+59.6	142.5	49	55.6	+59.8	143.3	49	07.3	+59.8	144.0	48	18.6	+59.9	144.6	47	29.5	+59.9	145.1	46	39.9	+60.0	145.8	45
46	51	43.1	+59.7	142.4	50	55.4	+59.7	143.1	50	07.1	+59.9	143.8	49	18.5	+59.9	144.5	48	29.5	+60.0	145.2	47	40.0	+60.0	146.4	46
47	52	42.8	+59.6	142.2	51	55.1	+59.8	143.0	51	07.0	+59.8	143.7	50	18.4	+59.9	144.4	49	29.4	+59.9	145.1	48	39.9	+60.0	145.8	47
48	53	42.4	+59.6	142.0	52	54.9	+59.7	142.8	52	06.8	+59.8	143.6	51	18.3	+59.9	144.3	50	29.3	+60.0	145.1	49	39.9	+60.0	146.5	48
49	54	42.0	+59.6	141.8	53	54.6	+59.7	142.7	53	06.6	+59.8	143.5	52	18.2	+59.8	144.2	51	29.2							

33°, 327° L.H.A.

LATITUDE SAME NAME AS DECLINATION

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 33°, 327°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z			
0	5 52.0 -59.9	146.8	5 01.8 -59.9	146.9	4 11.5 -59.9	146.9	3 21.2 -59.9	146.9	2 30.9 -59.9	147.0	1 40.6 -60.0	147.0	0 50.3 -60.0	147.0	0 00.0 +60.0	33.0	0 00.0 +60.0	33.0	0 00.0 +60.0	33.0	0 00.0 +60.0	33.0	0 00.0 +60.0	33.0	0		
1	4 52.1 -59.9	146.9	4 01.9 -59.9	146.9	3 11.6 -60.0	146.9	2 21.3 -60.0	147.0	1 31.0 -60.0	147.0	0 40.6 -59.9	147.0	0 09.7 +60.0	33.0	1 00.0 +60.0	33.0	2 00.0 +60.0	33.0	3 00.0 +60.0	33.0	4 00.0 +60.0	33.0	5 00.0 +60.0	33.0	1		
2	3 52.2 -59.8	146.9	3 02.0 -59.9	147.0	2 11.6 -59.9	147.0	1 21.3 -59.9	147.0	0 31.0 -60.0	147.0	0 29.0 +60.0	33.0	1 19.3 +60.0	33.0	2 09.7 +60.0	33.0	3 00.0 +60.0	33.0	4 00.0 +60.0	33.0	5 00.0 +60.0	33.0	2				
3	2 52.4 -59.9	147.0	2 02.1 -60.0	147.0	1 11.7 -59.9	147.0	0 21.4 -60.0	147.1	0 11.8 -60.0	147.1	0 38.6 +60.0	32.9	1 29.0 +59.9	32.9	2 19.3 +60.0	32.9	3 09.7 +60.0	33.0	4 00.0 +60.0	33.0	5 00.0 +60.0	33.0	3				
4	1 52.5 -59.9	147.1	1 02.1 -59.9	147.1	0 11.8 -60.0	147.1	0 48.2 +59.9	32.9	1 38.6 +59.9	32.9	2 28.9 +60.0	32.9	3 19.3 +60.0	32.9	4 09.7 +60.0	33.0	5 00.0 +60.0	33.0	6 00.0 +60.0	33.0	7 00.0 +60.0	33.0	4				
5	0 52.6 -59.8	147.1	0 02.2 -59.9	147.1	0 48.2 +59.9	32.8	1 48.1 +59.9	32.8	2 38.5 +60.0	32.8	3 28.9 +60.0	32.9	4 19.3 +60.0	32.9	5 09.7 +60.0	32.9	6 00.0 +60.0	33.0	7 00.0 +60.0	33.0	8 00.0 +60.0	33.0	9 00.0 +60.0	33.0	9		
6	0 07.2 +59.9	32.8	0 57.7 +59.9	32.8	1 47.7 +59.9	32.8	2 48.0 +60.0	32.8	3 48.0 +59.9	32.7	4 28.9 +60.0	32.8	5 28.9 +59.9	32.8	6 19.3 +60.0	32.9	7 09.7 +60.0	32.9	8 00.0 +60.0	33.0	9 00.0 +60.0	33.0	10 00.0 +60.0	33.0	10		
7	1 07.1 +59.9	32.7	1 57.6 +59.9	32.7	2 48.0 +60.0	32.7	3 48.0 +59.9	32.7	4 28.9 +60.0	32.7	5 28.8 +59.9	32.7	6 19.3 +60.0	32.9	7 09.7 +60.0	32.9	8 00.0 +60.0	33.0	9 00.0 +60.0	33.0	10 00.0 +60.0	33.0	11 00.0 +60.0	33.0	11		
8	2 07.0 +59.8	32.7	2 57.5 +59.9	32.7	3 48.0 +59.9	32.7	4 28.6 +60.0	32.8	5 28.9 +59.9	32.8	6 19.3 +60.0	32.9	7 09.7 +60.0	32.9	8 00.0 +60.0	33.0	9 00.0 +60.0	33.0	10 00.0 +60.0	33.0	11 00.0 +60.0	33.0	12 00.0 +60.0	33.0	12		
9	3 06.8 +59.9	32.6	3 57.4 +59.9	32.6	4 47.9 +59.9	32.7	5 38.4 +59.9	32.7	6 28.8 +60.0	32.8	7 19.3 +60.0	32.8	8 09.7 +60.0	32.9	9 00.0 +60.0	33.0	10 00.0 +60.0	33.0	11 00.0 +60.0	33.0	12 00.0 +60.0	33.0	13 00.0 +60.0	33.0	13		
10	4 06.7 +59.9	32.5	4 57.3 +59.9	32.6	5 47.8 +59.9	32.6	6 38.3 +60.0	32.7	7 28.8 +60.0	32.7	8 19.3 +59.9	32.8	9 09.7 +60.0	32.9	10 00.0 +60.0	33.0	11 00.0 +60.0	33.0	12 00.0 +60.0	33.0	13 00.0 +60.0	33.0	14 00.0 +60.0	33.0	14		
11	5 06.6 +59.8	32.5	5 57.2 +59.9	32.5	6 47.7 +60.0	32.6	7 38.3 +59.9	32.6	8 28.8 +60.0	32.7	9 19.2 +60.0	32.8	10 09.7 +59.9	32.9	11 00.0 +60.0	33.0	12 00.0 +60.0	33.0	13 00.0 +60.0	33.0	14 00.0 +60.0	33.0	15 00.0 +60.0	33.0	15		
12	6 06.4 +59.9	32.4	6 57.1 +59.9	32.5	7 47.7 +59.9	32.5	8 38.2 +60.0	32.6	9 28.8 +59.9	32.7	10 19.2 +60.0	32.8	11 09.6 +60.0	32.9	12 00.0 +60.0	33.0	13 00.0 +60.0	33.0	14 00.0 +60.0	33.0	15 00.0 +60.0	33.0	16 00.0 +60.0	33.0	16		
13	7 06.3 +59.9	32.3	7 57.0 +59.9	32.4	8 47.6 +59.9	32.5	9 38.2 +60.0	32.6	10 28.7 +60.0	32.7	11 19.2 +60.0	32.8	12 09.6 +60.0	32.9	13 00.0 +60.0	33.0	14 00.0 +60.0	33.0	15 00.0 +60.0	33.0	16 00.0 +60.0	33.0	17 00.0 +60.0	33.0	17		
14	8 06.2 +59.8	32.3	8 56.9 +59.9	32.3	9 47.5 +60.0	32.4	10 38.2 +59.9	32.5	11 28.7 +60.0	32.6	12 19.2 +60.0	32.7	13 09.6 +60.0	32.9	14 00.0 +60.0	33.0	15 00.0 +60.0	33.0	16 00.0 +60.0	33.0	17 00.0 +60.0	33.0	18 00.0 +60.0	33.0	18		
15	9 06.0 +59.9	32.2	9 56.8 +59.9	32.3	10 47.5 +59.9	32.4	11 38.1 +60.0	32.5	12 28.7 +60.0	32.6	13 19.2 +60.0	32.7	14 09.6 +60.0	32.9	15 00.0 +60.0	33.0	16 00.0 +60.0	33.0	17 00.0 +60.0	33.0	18 00.0 +60.0	33.0	19 00.0 +60.0	33.0	19		
16	10 05.9 +59.8	32.1	10 56.7 +59.9	32.2	11 47.4 +59.9	32.3	12 38.1 +59.9	32.4	13 28.7 +59.9	32.6	14 19.2 +60.0	32.7	15 09.6 +60.0	32.8	16 00.0 +60.0	33.0	17 00.0 +60.0	33.0	18 00.0 +60.0	33.0	19 00.0 +60.0	33.0	20 00.0 +60.0	33.0	20		
17	11 05.7 +59.9	32.1	11 56.6 +59.9	32.2	12 47.3 +60.0	32.3	13 38.0 +60.0	32.4	14 28.6 +60.0	32.5	15 19.2 +60.0	32.7	16 09.6 +60.0	32.8	17 00.0 +60.0	33.0	18 00.0 +60.0	33.0	19 00.0 +60.0	33.0	20 00.0 +60.0	33.0	21 00.0 +60.0	33.0	21		
18	12 05.6 +59.9	32.0	12 56.5 +59.9	32.1	13 47.3 +59.9	32.2	14 38.0 +59.9	32.4	15 28.6 +60.0	32.5	16 19.2 +60.0	32.7	17 09.6 +60.0	32.8	18 00.0 +60.0	33.0	19 00.0 +60.0	33.0	20 00.0 +60.0	33.0	21 00.0 +60.0	33.0	22 00.0 +60.0	33.0	22		
19	13 05.5 +59.8	31.9	13 56.4 +59.9	32.0	14 47.2 +59.9	32.2	15 37.9 +60.0	32.3	16 28.6 +60.0	32.5	17 19.2 +59.9	32.6	18 09.6 +60.0	32.8	19 00.0 +60.0	33.0	20 00.0 +60.0	33.0	21 00.0 +60.0	33.0	22 00.0 +60.0	33.0	23 00.0 +60.0	33.0	23		
20	14 05.3 +59.9	31.8	14 56.3 +59.9	32.0	15 47.1 +59.9	32.1	16 37.9 +59.9	32.3	17 28.6 +59.9	32.4	18 19.1 +60.0	32.6	19 09.6 +60.0	32.8	20 00.0 +60.0	33.0	21 00.0 +60.0	33.0	22 00.0 +60.0	33.0	23 00.0 +60.0	33.0	24 00.0 +60.0	33.0	24		
21	15 05.2 +59.8	31.8	15 56.2 +59.9	31.9	16 47.0 +60.0	32.1	17 37.8 +60.0	32.2	18 28.5 +60.0	32.4	19 19.1 +60.0	32.6	20 09.6 +60.0	32.8	21 00.0 +60.0	33.0	22 00.0 +60.0	33.0	23 00.0 +60.0	33.0	24 00.0 +60.0	33.0	25 00.0 +60.0	33.0	25		
22	16 05.0 +59.9	31.7	16 56.1 +59.8	31.9	17 47.0 +59.9	32.0	18 37.8 +59.9	32.2	19 28.5 +60.0	32.4	20 19.1 +60.0	32.6	21 09.6 +60.0	32.8	22 00.0 +60.0	33.0	23 00.0 +60.0	33.0	24 00.0 +60.0	33.0	25 00.0 +60.0	33.0	26 00.0 +60.0	33.0	26		
23	17 04.9 +59.9	31.6	17 55.9 +59.9	31.8	18 46.9 +59.9	32.0	19 37.7 +60.0	32.2	20 28.5 +59.9	32.4	21 19.1 +60.0	32.6	22 09.6 +60.0	32.8	23 00.0 +60.0	33.0	24 00.0 +60.0	33.0	25 00.0 +60.0	33.0	26 00.0 +60.0	33.0	27 00.0 +60.0	33.0	27		
24	18 04.8 +59.8	31.6	18 55.8 +59.9	31.7	19 46.8 +59.9	31.9	20 37.7 +59.9	32.1	21 28.4 +60.0	32.3	22 19.1 +60.0	32.5	23 09.6 +60.0	32.7	24 00.0 +60.0	33.0	25 00.0 +60.0	33.0	26 00.0 +60.0	33.0	27 00.0 +60.0	33.0	28 00.0 +60.0	33.0	28		
25	19 04.6 +59.9	31.5	19 55.7 +59.9	31.7	20 46.7 +60.0	31.9	21 37.6 +60.0	32.1	22 28.4 +60.0	32.3	23 19.1 +60.0	32.5	24 09.6 +60.0	32.8	25 00.0 +60.0	33.0	26 00.0 +60.0	33.0	27 00.0 +60.0	33.0	28 00.0 +60.0	33.0	29 00.0 +60.0	33.0	29		
26	20 04.5 +59.8	31.4	20 55.6 +59.9	31.6	21 46.7 +59.9	31.8	22 37.6 +59.9	32.0	23 28.4 +60.0	32.3	24 19.1 +60.0	32.5	25 09.6 +60.0	32.7	26 00.0 +60.0	33.0	27 00.0 +60.0	33.0	28 00.0 +60.0	33.0	29 00.0 +60.0	33.0	30 00.0 +60.0	33.0	30		
27	21 04.3 +59.9	31.3	21 55.5 +59.9	31.5	22 46.6 +59.9	31.8	23 37.5 +60.0	32.0	24 28.4 +59.9	32.2	25 19.1 +59.9	32.5	26 09.6 +60.0	32.7	27 00.0 +60.0	33.0	28 00.0 +60.0	33.0	29 00.0 +60.0	33.0	30 00.0 +60.0	33.0	31 00.0 +60.0	33.0	31		
28	22 04.2 +59.8	31.3	22 55.4 +59.9	31.5	23 46.5 +59.9	31.7	24 36.5 +59.9	31.9	25 28.3 +60.0	32.1	26 19.0 +60.0	32.4	27 09.6 +60.0	32.7	28 00.0 +60.0	33.0	29 00.0 +60.0	33.0	30 00.0 +60.0	33.0	31 00.0 +60.0	33.0	32 00.0 +60.0	33.0	32		
29	23 04.0 +59.8	30.8	23 54.7 +59.8	31.1	24 46.0 +59.9	31.3	25 37.2 +59.9	31.6	26 28.1 +60.0	32.0	27 19.0 +60.0	32.3	28 09.6 +60.0	32.6	29 00.0 +60.0	33.0	30 00.0 +60.0	33.0	31 00.0 +60.0	33.0	32 00.0 +60.0	33.0	33 00.0 +60.0	33.0	34 00.0 +60.0	33.0	34
3																											

34°, 326° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.
0	5 47.9 +59.9 145.8	4 58.3 +59.9 145.9	4 08.6 +59.9 145.9	3 18.9 +60.0 145.9	2 29.2 +60.0 146.0	1 39.5 +60.0 146.0	0 49.7 +60.0 146.0	0 00.0 +60.0 146.0	0	5 47.9 +59.9 145.8	4 58.3 +59.9 145.8	4 08.6 +60.0 145.8	3 18.9 +59.9 145.9	2 29.2 +60.0 145.9	1 39.5 +60.0 145.9	0 49.7 +60.0 146.0	0 00.0 +60.0 146.0	0	0	0	0	0	0	0	0
1	6 47.8 +59.8 145.7	5 58.2 +59.9 145.8	5 08.5 +60.0 145.8	4 18.9 +59.9 145.9	3 29.2 +60.0 145.9	2 39.5 +60.0 146.0	1 49.7 +60.0 146.0	1 00.0 +60.0 146.0	1	6 47.8 +59.8 145.7	5 58.2 +59.9 145.7	5 08.5 +59.9 145.7	4 18.8 +60.0 145.9	3 29.2 +59.9 145.9	2 39.5 +59.9 145.9	1 49.7 +60.0 146.0	2 00.0 +60.0 146.0	2	0	0	0	0	0	0	0
2	7 47.6 +59.9 145.7	6 58.1 +59.9 145.7	6 08.5 +59.9 145.8	5 18.8 +60.0 145.9	4 29.2 +59.9 145.9	3 39.5 +59.9 145.9	2 49.7 +60.0 146.0	3 00.0 +60.0 146.0	3	7 47.6 +59.9 145.7	6 58.1 +59.9 145.7	6 08.4 +59.9 145.8	5 18.8 +59.9 145.8	4 29.1 +60.0 145.9	3 39.4 +60.0 145.9	2 49.7 +60.0 146.0	3 00.0 +60.0 146.0	3	0	0	0	0	0	0	0
3	8 47.5 +59.9 145.6	7 58.0 +59.9 145.7	7 08.4 +59.9 145.8	6 18.8 +59.9 145.8	5 29.1 +60.0 145.9	4 39.4 +60.0 145.9	3 49.7 +60.0 146.0	4 00.0 +60.0 146.0	4	8 47.5 +59.9 145.6	7 58.0 +59.9 145.6	8 08.3 +60.0 145.7	7 18.7 +60.0 145.8	6 29.1 +60.0 145.8	5 39.4 +60.0 145.9	4 49.7 +60.0 146.0	4 00.0 +60.0 146.0	4	0	0	0	0	0	0	0
4	9 47.4 +59.8 145.5	8 57.9 +59.9 145.5	8 08.3 +60.0 145.7	7 18.7 +60.0 145.8	6 29.1 +60.0 145.8	5 39.4 +60.0 145.9	4 49.7 +60.0 146.0	5 00.0 +60.0 146.0	5	9 47.4 +59.8 145.5	8 57.9 +59.9 145.5	9 08.3 +59.9 145.7	8 18.7 +59.9 145.7	7 29.1 +59.9 145.8	6 39.4 +60.0 145.8	5 49.7 +60.0 145.9	5 00.0 +60.0 146.0	5	0	0	0	0	0	0	0
5	10 47.2 +59.8 145.5	9 57.8 +59.9 145.6	9 08.3 +59.9 145.7	8 18.7 +59.9 145.7	7 29.1 +59.9 145.8	6 39.4 +60.0 145.9	5 49.7 +60.0 145.9	5 00.0 +60.0 146.0	6	11 47.1 +59.8 145.4	10 57.7 +59.8 145.5	10 08.2 +59.9 145.6	9 18.6 +60.0 145.7	8 29.0 +60.0 145.8	7 39.4 +60.0 145.9	6 49.7 +60.0 145.9	6 00.0 +60.0 146.0	6	0	0	0	0	0	0	0
7	12 46.9 +59.9 145.3	11 57.5 +59.9 145.4	11 08.1 +59.9 145.6	10 18.6 +59.9 145.7	9 29.0 +60.0 145.8	8 39.4 +60.0 145.8	7 49.7 +60.0 145.9	7 00.0 +60.0 146.0	7	13 46.8 +59.8 145.2	12 57.4 +59.9 145.4	12 08.0 +60.0 145.5	11 18.5 +60.0 145.6	10 29.0 +60.0 145.7	9 39.4 +60.0 145.8	8 49.7 +60.0 145.9	8 00.0 +60.0 146.0	8	0	0	0	0	0	0	0
9	14 46.6 +59.8 145.2	13 57.3 +59.9 145.3	13 08.0 +59.9 145.4	12 18.5 +60.0 145.6	11 29.0 +59.9 145.7	10 39.4 +60.0 145.8	9 49.7 +60.0 145.9	9 00.0 +60.0 146.0	9	15 46.5 +59.8 145.1	14 57.2 +59.9 145.2	14 07.9 +59.9 145.4	13 18.5 +59.9 145.5	12 28.9 +60.0 145.7	11 39.4 +60.0 145.8	10 49.7 +60.0 145.9	10 00.0 +60.0 146.0	10	0	0	0	0	0	0	0
10	16 46.3 +59.8 145.0	15 57.1 +59.9 145.2	15 07.8 +59.9 145.3	14 18.4 +60.0 145.5	13 28.9 +60.0 145.6	12 39.4 +59.9 145.8	11 49.7 +60.0 145.9	11 00.0 +60.0 146.0	11	17 46.2 +59.8 144.9	16 57.0 +59.9 145.1	16 07.7 +59.9 145.3	15 18.4 +59.9 145.5	14 28.9 +60.0 145.6	13 39.3 +60.0 145.7	12 49.7 +60.0 145.9	12 00.0 +60.0 146.0	12	0	0	0	0	0	0	0
12	18 46.0 +59.9 144.9	17 56.9 +59.9 145.1	17 07.6 +60.0 145.2	16 18.3 +60.0 145.4	15 28.9 +59.9 145.6	14 39.3 +60.0 145.7	13 49.7 +60.0 145.9	13 00.0 +60.0 146.0	13	19 45.9 +59.8 144.8	18 56.8 +59.9 145.0	18 07.6 +59.9 145.2	17 18.3 +59.9 145.4	16 28.8 +60.0 145.5	15 39.3 +60.0 145.7	14 49.7 +60.0 145.9	14 00.0 +60.0 146.0	14	0	0	0	0	0	0	0
14	20 45.7 +59.8 144.7	19 56.7 +59.8 144.9	19 07.5 +59.9 145.1	18 18.2 +60.0 145.3	17 28.8 +60.0 145.5	16 39.3 +60.0 145.7	15 49.7 +60.0 145.8	15 00.0 +60.0 146.0	15	21 45.5 +59.8 144.6	20 56.5 +59.9 144.9	20 07.4 +59.9 145.1	19 18.2 +59.9 145.3	18 28.6 +59.9 145.5	17 39.3 +60.0 145.7	16 49.7 +60.0 145.8	16 00.0 +60.0 146.0	16	0	0	0	0	0	0	0
16	22 45.4 +59.8 144.6	21 56.4 +59.9 144.8	21 07.3 +59.9 145.0	20 18.1 +59.9 145.2	19 28.7 +60.0 145.4	18 39.3 +60.0 145.6	17 49.7 +60.0 145.8	17 00.0 +60.0 146.0	17	23 45.2 +59.8 144.5	22 56.3 +59.9 144.7	22 07.2 +60.0 145.0	21 18.0 +60.0 145.2	20 28.7 +60.0 145.4	19 39.3 +60.0 145.6	18 49.7 +60.0 145.8	18 00.0 +60.0 146.0	18	0	0	0	0	0	0	0
18	24 45.0 +59.9 144.4	23 56.2 +59.9 144.7	23 07.2 +59.9 144.9	22 18.0 +59.9 145.1	21 28.7 +60.0 145.4	20 39.3 +59.9 145.6	19 49.7 +60.0 145.8	19 00.0 +60.0 146.0	19	25 44.9 +59.8 144.3	24 56.1 +59.8 144.6	24 07.1 +59.9 144.8	23 17.9 +60.0 145.1	22 28.7 +59.9 145.3	21 39.2 +60.0 145.6	20 49.7 +60.0 145.8	20 00.0 +60.0 146.0	20	0	0	0	0	0	0	0
20	26 44.7 +59.8 144.2	25 55.9 +59.9 144.5	25 07.0 +59.9 144.8	24 17.9 +59.9 145.1	23 28.6 +60.0 145.3	22 39.2 +60.0 145.5	21 49.7 +60.0 145.8	21 00.0 +60.0 146.0	21	27 44.5 +59.8 144.1	26 55.8 +59.9 144.4	26 06.9 +59.9 144.7	25 17.8 +60.0 145.0	24 28.6 +60.0 145.3	23 39.2 +60.0 145.5	22 49.7 +60.0 145.8	22 00.0 +60.0 146.0	22	0	0	0	0	0	0	0
22	28 44.3 +59.9 144.1	27 55.7 +59.8 144.4	27 06.8 +59.9 144.7	26 17.8 +59.9 145.0	25 28.6 +59.9 145.2	24 39.2 +60.0 145.5	23 49.7 +60.0 145.8	23 00.0 +60.0 146.0	23	29 44.2 +59.8 144.0	28 55.5 +59.9 144.3	28 06.7 +59.9 144.6	27 17.7 +60.0 144.9	26 28.5 +60.0 145.2	25 39.2 +60.0 145.5	24 49.7 +60.0 145.7	24 00.0 +60.0 146.0	24	0	0	0	0	0	0	0
24	30 44.0 +59.8 143.9	29 55.4 +59.8 144.2	29 06.6 +59.9 144.5	28 17.7 +59.9 144.9	27 28.5 +60.0 145.2	26 39.2 +60.0 145.5	25 49.7 +60.0 145.7	25 00.0 +60.0 146.0	25	31 43.8 +59.8 143.8	30 55.3 +59.8 144.1	30 06.5 +59.9 144.5	29 17.6 +59.9 144.8	28 28.5 +59.9 145.1	27 39.2 +59.9 145.4	26 49.7 +60.0 145.7	26 00.0 +60.0 146.0	26	0	0	0	0	0	0	0
26	32 43.6 +59.8 143.7	31 55.1 +59.9 144.1	31 06.4 +59.9 144.4	30 17.5 +60.0 144.8	29 28.4 +60.0 145.1	28 39.1 +60.0 145.4	27 49.7 +60.0 145.7	27 00.0 +60.0 146.0	27	33 43.4 +59.8 143.6	32 55.0 +59.8 143.6	32 06.3 +59.9 144.3	31 17.5 +59.9 144.7	30 28.4 +60.0 145.0	29 39.1 +60.0 145.3	28 49.7 +60.0 145.6	28 00.0 +60.0 146.0	28	0	0	0	0	0	0	0
28	34 43.2 +59.8 143.5	33 54.8 +59.9 143.9	33 06.2 +59.9 144.3	32 17.4 +60.0 144.7	31 28.4 +59.9 145.0	30 39.1 +60.0 145.4	29 49.7 +59.9 145.7	29 00.0 +60.0 146.0	29	35 43.0 +59.8 143.4	34 54.7 +59.8 143.8	34 06.1 +59.9 144.2	33 17.4 +59.9 144.6	32 28.3 +60.0 145.0	31 39.1 +60.0 145.3	30 49.6 +60.0 145.7	30 00.0 +60.0 146.0	30	0	0	0	0	0	0	0
30	36 42.8 +59.7 143.3	35 54.5 +59.8 143.7	35 06.0 +59.9 144.1	34 17.3 +59.9 144.5	33 28.3 +60.0 144.9	32 39.1 +60.0 145.3	31 49.6 +60.0 145.7	31 00.0 +60.0 146.0	31	37 42.5 +59.8 143.2	36 54.4 +59.8 143.6	36 05.9 +59.9 144.1	35 17.2 +59.9 144.5	34 28.3 +59.9 144.9	33 39.1 +59.9 145.3	32 49.6 +60.0 145.6	32 00.0 +60.0 146.0	32	0	0	0	0	0	0	0
32	38 42.3 +59.8 143.1	37 54.2 +59.8 143.5	37 05.8 +59.9 144.0	36 17.1 +60.0 144.4	35 28.2 +60.0 144.8	34 39.0 +60.0 145.1	33 49.6 +60.0 145.4	33 00.0 +60.0 146.0	33	39 42.1 +59.7 142.9	40 54.0 +59.8 143.4	38 05.7 +59.9 143.9	37 17.1 +59.9 144.4	36 28.2 +60.0 144.8	35 39.0 +60.0 145.2	34 49.6 +60.0 145.4	34 00.0 +60.0 146.0	34	0	0	0	0	0	0	0
34	40 41.8 +59.8 142.8	39 53.9 +59.8 143.3	39 05.6 +59.9 143.8	38 17.0 +59.9 144.3	37 28.1 +60.0 144.8	36 39.0 +60.0 145.2	35 49.6 +60.0 145.5	35 00.0 +60.0 146.0	35	41 41.6 +59.7 142.7	40 53.7 +59.8 143.2	40 05.5 +59.8 143.7	39 16.9 +60.0 144.2	38 28.1 +60.0 144.7	37 39.0 +60.0 145.2	36 49.6 +60.0 145.6	36 00.0 +60.0 146.0	36	0	0	0	0	0	0	0
36	42 41.4 +59.8 142.6	41 53.5 +59.8 143.1	41 05.3 +59.9 143.7	40 16.9 +59.9 144.2	39 28.1 +59.9 144.7	38 39.0 +60.0 145.1	37 49.6 +60.0 145.6	37 00.0 +60.0 146.0	37	43 41.1 +59.7 142.5	42 53.3 +59.8 143.0	42 05.2 +59.9 143.6	41 16.8 +59.9 144.1	40 28.0 +60.0 144.6	39 39.0 +60.0 145.1	38 49.6 +60.0 145.6	38 00.0 +60.0 146.0	38	0	0	0	0	0	0	0
38	44 40.5 +59.7 142.4	43 52.9 +59.8 142.8	43 04.9 +59.8 142.9	42 16.1 +59.9 143.6	41 27.7 +59.9 144.2	40 38.8 +60.0 144.8	45 49.6 +60.0 145.4	45 00.0 +60.0 146.0	45	46 40.2 +59.7 142.0	50 51.6 +59.7 142.0	50 04.0 +59.8 142.8													

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 34° , 326°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	5	47.9	-59.8	145.8	4	58.3	-59.9	145.9	4	08.6	-59.9	145.9	3	18.9	-59.9	145.9	2	29.2	-60.0	146.0	1	39.5	-60.0	146.0	0	49.7	-60.0	146.0	0	0.00	+60.0	34.0	0
1	4	48.1	-59.9	145.9	3	58.4	-59.9	145.9	3	08.7	-59.9	145.9	2	19.0	-60.0	146.0	1	29.2	-59.9	146.0	0	39.5	-60.0	146.0	0	10.3	+60.0	34.0	1				
2	3	48.2	-59.9	145.9	2	58.5	-59.9	146.0	2	08.8	-60.0	146.0	1	19.0	-59.9	146.0	0	29.3	-60.0	146.0	0	20.5	+60.0	34.0	2								
3	2	48.3	-59.8	146.0	1	58.6	-59.9	146.0	1	08.8	-59.9	146.0	0	19.1	-60.0	146.1	0	40.9	+60.0	33.9	0	30.7	+60.0	33.9	1	20.5	+60.0	34.0	3				
4	1	48.5	-59.9	146.1		0	58.7	-59.9	146.1	0	08.9	-59.9	146.1	0	40.9	+60.0	33.9	1	30.7	+60.0	33.9	2	20.5	+60.0	34.0	4							
5	0	48.6	-59.8	146.1		0	01.2	+59.9	33.9	0	51.0	+60.0	33.9	1	40.9	+59.9	33.9	2	30.7	+60.0	33.9	3	20.5	+60.0	33.9	4	10.2	+60.0	34.0	5			
6	0	11.2	+59.9	33.8	1	01.1	+59.9	33.8	1	51.0	+59.9	33.8	2	40.8	+60.0	33.8	3	30.6	+60.0	33.9	4	20.5	+59.9	33.9	5	10.2	+60.0	34.0	6				
7	1	11.1	+59.9	33.7	2	01.0	+59.9	33.7	2	50.9	+59.9	33.8	3	40.8	+59.9	33.8	4	30.6	+60.0	33.8	5	20.4	+60.0	33.9	6	10.2	+60.0	34.0	7				
8	2	11.0	+59.8	33.7	3	00.9	+59.9	33.7	3	50.8	+59.9	33.7	4	40.7	+60.0	33.8	5	30.6	+60.0	33.8	6	20.4	+60.0	33.9	7	10.2	+60.0	34.0	8				
9	3	10.8	+59.9	33.6	4	00.8	+59.9	33.6	4	50.7	+60.0	33.7	5	40.7	+59.9	33.7	6	30.6	+59.9	33.8	7	20.4	+60.0	33.8	8	10.2	+60.0	34.0	9				
10	4	10.7	+59.8	33.5	5	00.7	+59.9	33.6	5	50.7	+59.9	33.6	6	40.6	+60.0	33.7	7	30.5	+60.0	33.7	8	20.4	+60.0	33.8	9	10.2	+60.0	33.9	10	0.00	+60.0	34.0	10
11	5	10.5	+59.9	33.4	6	00.6	+59.9	33.5	6	50.6	+59.9	33.6	7	40.6	+59.9	33.6	8	30.5	+60.0	33.7	9	20.4	+60.0	33.8	10	10.2	+60.0	33.9	11	0.00	+60.0	34.0	11
12	6	10.4	+59.9	33.4	7	00.5	+59.9	33.4	7	50.5	+60.0	33.5	8	40.5	+60.0	33.6	9	30.5	+60.0	33.7	10	20.4	+60.0	33.8	11	10.2	+60.0	34.0	12				
13	7	10.3	+59.8	33.3	8	00.4	+59.9	33.4	8	50.5	+59.9	33.5	9	40.5	+59.9	33.6	10	30.5	+59.9	33.7	11	20.4	+60.0	33.8	12	10.2	+60.0	33.9	13	0.00	+60.0	34.0	13
14	8	10.1	+59.9	33.2	9	00.3	+59.9	33.3	9	50.4	+59.9	33.4	10	40.4	+60.0	33.5	11	30.4	+60.0	33.6	12	20.4	+59.9	33.7	13	10.2	+60.0	33.9	14	0.00	+60.0	34.0	14
15	9	10.0	+59.8	33.2	10	00.2	+59.9	33.3	10	50.3	+59.9	33.4	11	40.4	+59.9	33.5	12	30.4	+60.0	33.6	13	20.3	+60.0	33.7	14	10.2	+60.0	33.9	15	0.00	+60.0	34.0	15
16	10	09.8	+59.9	33.1	11	00.1	+59.9	33.2	11	50.2	+60.0	33.3	12	40.3	+60.0	33.4	13	30.4	+59.9	33.6	14	20.3	+60.0	33.7	15	10.2	+60.0	33.8	16	0.00	+60.0	34.0	16
17	11	09.7	+59.8	33.0	12	00.0	+59.8	33.1	12	50.2	+59.9	33.3	13	40.3	+59.9	33.4	14	30.3	+60.0	33.5	15	20.3	+60.0	33.7	16	10.2	+60.0	33.8	17	0.00	+60.0	34.0	17
18	12	09.5	+59.9	33.0	12	59.8	+59.9	33.1	13	50.1	+59.9	33.2	14	40.2	+60.0	33.3	15	30.3	+60.0	33.5	16	20.3	+60.0	33.7	17	10.2	+60.0	33.8	18	0.00	+60.0	34.0	18
19	13	09.4	+59.8	32.9	13	59.7	+59.9	33.0	14	50.0	+59.9	33.2	15	40.2	+59.9	33.3	16	30.3	+60.0	33.5	17	20.3	+60.0	33.7	18	10.2	+60.0	33.8	19	0.00	+60.0	34.0	19
20	14	09.2	+59.9	32.8	14	59.6	+59.9	33.0	15	49.9	+60.0	33.1	16	40.1	+60.0	33.3	17	30.3	+59.9	33.4	18	20.3	+60.0	33.6	19	10.2	+60.0	33.8	20	0.00	+60.0	34.0	20
21	15	09.1	+59.8	32.7	15	59.5	+59.9	32.9	16	49.9	+59.9	33.1	17	40.1	+59.9	33.2	18	30.2	+60.0	33.4	19	20.3	+60.0	33.6	20	10.2	+60.0	33.8	21	0.00	+60.0	34.0	21
22	16	08.9	+59.9	32.7	16	59.4	+59.9	32.8	17	49.8	+59.9	33.0	18	40.0	+60.0	33.2	19	30.2	+60.0	33.4	20	20.3	+59.9	33.6	21	10.2	+60.0	33.8	22	0.00	+60.0	34.0	22
23	17	08.8	+59.8	32.6	17	59.3	+59.9	32.8	18	49.7	+59.9	32.9	19	40.0	+59.9	33.1	20	30.2	+60.0	33.3	21	20.2	+60.0	33.5	22	10.2	+60.0	33.8	23	0.00	+60.0	34.0	23
24	18	08.6	+59.9	32.5	18	59.2	+59.9	32.7	19	49.6	+59.9	32.9	20	39.9	+60.0	33.1	21	30.2	+59.9	33.3	22	20.2	+60.0	33.5	23	10.2	+60.0	33.8	24	0.00	+60.0	34.0	24
25	19	08.5	+59.8	32.4	19	59.1	+59.8	32.6	20	49.5	+60.0	32.8	21	39.9	+59.9	33.0	22	30.1	+60.0	33.3	23	20.2	+60.0	33.5	24	10.2	+60.0	33.8	25	0.00	+60.0	34.0	25
26	20	08.3	+59.9	32.4	20	58.9	+59.9	32.6	21	49.5	+59.9	32.8	22	39.8	+60.0	33.0	23	30.1	+60.0	33.2	24	20.2	+60.0	33.5	25	10.2	+60.0	33.8	26	0.00	+60.0	34.0	26
27	21	08.2	+59.8	32.3	21	58.8	+59.9	32.5	22	49.4	+59.9	32.7	23	39.8	+59.9	33.0	24	30.1	+59.9	33.2	25	20.2	+60.0	33.5	26	10.2	+60.0	33.8	27	0.00	+60.0	34.0	27
28	22	08.0	+59.8	32.2	22	58.7	+59.9	32.4	23	49.3	+59.9	32.7	24	39.7	+60.0	32.9	25	30.0	+60.0	33.2	26	20.2	+60.0	33.4	27	10.2	+60.0	33.8	28	0.00	+60.0	34.0	28
29	23	07.8	+59.9	32.1	23	58.6	+59.9	32.4	24	49.2	+59.9	32.6	25	39.7	+59.9	32.9	26	30.0	+60.0	33.1	27	20.2	+59.9	33.4	28	10.2	+60.0	33.8	29	0.00	+60.0	34.0	29
30	24	07.7	+59.8	32.0	24	58.5	+59.8	32.3	25	49.1	+59.9	32.5	26	39.6	+60.0	32.8	27	30.0	+59.9	33.1	28	20.1	+60.0	33.4	29	10.2	+60.0	33.8	30	0.00	+60.0	34.0	30
31	25	07.5	+59.8	32.0	25	58.3	+59.9	32.2	26	49.0	+59.9	32.5	27	39.6	+59.9	32.8	28	29.9	+60.0	33.1	29	20.1	+60.0	33.4	30	10.2	+60.0	33.8	31	0.00	+60.0	34.0	31
32	26	07.3	+59.9	31.9	26	58.2	+59.9	32.1	27	48.9	+59.9	32.4	28	39.5	+59.9	32.7	29	29.9	+60.0	33.0	30	20.1	+60.0	33.3	31	10.2	+60.0	33.8	32	0.00	+60.0	34.0	32
33	27	07.2	+59.8	31.8	27	58.1	+59.8	32.1	28	48.8	+59.9	32.4	29	39.4	+60.0	32.7	30	29.9	+59.9	33.0	31	20.1	+60.0	33.3	32	10.2	+59.9	33.6	33	0.00	+60.0	34.0	33
34	28	07.0	+59.8	31.7	28	57.9	+59.8	32.0	29	48.7	+60.0	32.3	30	39.4	+59.9	32.6	31	29.8	+60.0	32.9	32	20.1	+60.0	33.3	33	10.1	+60.0	33.6	34	0.00	+60.0	34.0	34
35	29	06.8	+59.8	31.6	29	57.8	+																										

35°, 325° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.
0	5 43.8 +59.8 144.8	4 54.7 +59.9 144.9	4 05.6 +60.0 144.9	3 16.5 +60.0 144.9	2 27.4 +60.0 145.0	1 38.3 +60.0 145.0	0 49.1 +60.0 145.0	0 00.0 +60.0 145.0	0	5 43.8 +59.8 144.8	4 54.7 +59.9 144.8	4 05.6 +59.9 144.8	3 16.5 +59.9 144.9	2 27.4 +60.0 144.9	1 38.3 +60.0 144.9	0 49.1 +60.0 145.0	0 00.0 +60.0 145.0	0	0	0	0	0	0	0	0
1	6 43.6 +59.9 144.7	5 54.6 +59.9 144.8	5 05.6 +59.9 144.8	4 16.5 +59.9 144.9	3 27.4 +60.0 144.9	2 38.3 +60.0 145.0	1 49.1 +60.0 145.0	1 00.0 +60.0 145.0	1	6 43.6 +59.9 144.7	5 54.6 +59.9 144.7	5 05.5 +59.9 144.8	4 16.4 +60.0 144.9	3 27.4 +59.9 144.9	2 38.3 +60.0 144.9	1 49.1 +60.0 145.0	2 00.0 +60.0 145.0	2	0	0	0	0	0	0	0
2	7 43.5 +59.8 144.7	6 54.5 +59.9 144.7	6 05.5 +59.9 144.8	5 16.4 +60.0 144.9	4 27.4 +59.9 144.9	3 38.3 +60.0 144.9	2 49.1 +60.0 145.0	2 00.0 +60.0 145.0	2	7 43.5 +59.8 144.7	6 54.4 +59.9 144.7	6 05.4 +59.9 144.7	5 16.3 +60.0 144.8	4 27.3 +60.0 144.8	3 38.3 +59.9 144.9	2 49.1 +60.0 145.0	3 00.0 +60.0 145.0	3	0	0	0	0	0	0	0
3	8 43.3 +59.8 144.6	7 54.4 +59.9 144.7	7 05.4 +59.9 144.7	6 16.4 +59.9 144.8	5 27.3 +60.0 144.9	4 38.3 +59.9 144.9	3 49.1 +60.0 145.0	3 00.0 +60.0 145.0	4	8 43.3 +59.8 144.6	7 54.3 +59.9 144.6	8 05.3 +60.0 144.7	7 16.3 +60.0 144.8	6 27.3 +60.0 144.8	5 38.2 +60.0 144.9	4 49.1 +60.0 145.0	4 00.0 +60.0 145.0	4	0	0	0	0	0	0	0
4	9 43.2 +59.8 144.5	8 54.3 +59.9 144.6	8 05.3 +60.0 144.7	7 16.3 +60.0 144.8	6 27.3 +60.0 144.8	5 38.2 +60.0 144.9	4 49.1 +60.0 145.0	4 00.0 +60.0 145.0	5	10 43.0 +59.8 144.4	9 54.2 +59.9 144.5	9 05.3 +59.9 144.6	8 16.3 +60.0 144.7	7 27.3 +60.0 144.8	6 38.2 +60.0 144.9	5 49.1 +60.0 144.9	5 00.0 +60.0 145.0	5	0	0	0	0	0	0	0
6	11 42.9 +59.8 144.4	10 54.1 +59.8 144.5	10 05.2 +59.9 144.6	9 16.3 +59.9 144.7	8 27.3 +59.9 144.8	7 38.2 +60.0 144.9	6 49.1 +60.0 144.9	6 00.0 +60.0 145.0	6	11 42.9 +59.8 144.4	10 54.0 +59.8 144.4	11 05.1 +59.9 144.5	10 16.2 +60.0 144.6	9 27.2 +60.0 144.8	8 38.2 +60.0 144.8	7 49.1 +60.0 144.9	7 00.0 +60.0 145.0	7	0	0	0	0	0	0	0
7	12 42.7 +59.9 144.3	11 53.9 +59.9 144.4	11 05.1 +59.9 144.5	10 16.2 +60.0 144.6	9 27.2 +60.0 144.8	8 38.2 +60.0 144.8	7 49.1 +60.0 144.9	7 00.0 +60.0 145.0	8	12 42.7 +59.9 144.3	11 53.8 +59.9 144.4	12 05.0 +60.0 144.5	11 16.2 +59.9 144.6	10 27.2 +60.0 144.7	9 38.2 +60.0 144.8	8 49.1 +60.0 144.9	8 00.0 +60.0 145.0	8	0	0	0	0	0	0	0
9	14 42.4 +59.8 144.1	13 53.7 +59.9 144.3	13 05.0 +59.9 144.4	12 16.1 +60.0 144.6	11 27.2 +59.9 144.7	10 38.2 +60.0 144.8	9 49.1 +60.0 144.9	9 00.0 +60.0 145.0	9	14 42.4 +59.8 144.1	13 53.6 +59.9 144.2	14 04.9 +59.9 144.4	13 16.1 +59.9 144.5	12 27.1 +60.0 144.7	11 38.2 +60.0 144.8	10 49.1 +60.0 144.9	10 00.0 +60.0 145.0	10	0	0	0	0	0	0	0
10	15 42.2 +59.9 144.1	14 53.6 +59.9 144.2	14 04.9 +59.9 144.4	13 16.1 +59.9 144.5	12 27.1 +60.0 144.7	11 38.2 +60.0 144.8	10 49.1 +60.0 144.9	10 00.0 +60.0 145.0	11	16 42.1 +59.8 144.0	15 53.5 +59.9 144.2	15 04.8 +59.9 144.3	14 16.0 +59.9 144.5	13 27.1 +60.0 144.6	12 38.2 +59.9 144.8	11 49.1 +60.0 144.9	11 00.0 +60.0 145.0	11	0	0	0	0	0	0	0
12	17 41.9 +59.9 143.9	16 53.4 +59.8 144.1	16 04.7 +59.9 144.3	15 15.9 +60.0 144.4	14 27.1 +60.0 144.6	13 38.1 +60.0 144.7	12 49.1 +60.0 144.8	12 00.0 +60.0 145.0	12	17 41.9 +59.9 143.9	16 53.3 +59.8 144.0	17 04.6 +59.9 144.2	16 15.9 +59.9 144.4	15 27.1 +59.9 144.6	14 38.1 +60.0 144.7	13 49.1 +60.0 144.9	13 00.0 +60.0 145.0	13	0	0	0	0	0	0	0
14	19 41.6 +59.8 143.8	18 53.1 +59.9 144.0	18 04.5 +60.0 144.2	17 15.8 +60.0 144.4	16 27.0 +60.0 144.5	15 38.1 +60.0 144.7	14 49.1 +60.0 144.9	14 00.0 +60.0 145.0	14	19 41.6 +59.8 143.8	18 53.0 +59.9 144.1	19 04.5 +59.9 143.9	18 15.8 +59.9 144.3	17 27.0 +60.0 144.5	16 38.1 +60.0 144.7	15 49.1 +60.0 144.8	15 00.0 +60.0 145.0	15	0	0	0	0	0	0	0
15	20 41.4 +59.9 143.7	19 53.0 +59.9 143.9	19 04.5 +59.9 144.1	18 15.8 +59.9 144.3	17 27.0 +60.0 144.5	16 38.1 +60.0 144.7	15 49.1 +60.0 144.8	15 00.0 +60.0 145.0	16	21 41.3 +59.8 143.6	20 52.9 +59.9 143.8	20 04.4 +59.9 144.1	19 15.7 +60.0 144.3	18 27.0 +59.9 144.5	17 38.1 +60.0 144.7	16 49.1 +60.0 144.8	16 00.0 +60.0 145.0	16	0	0	0	0	0	0	0
17	22 41.1 +59.8 143.5	21 52.8 +59.8 143.8	21 04.3 +59.9 144.0	20 15.7 +59.9 144.2	19 26.9 +60.0 144.4	18 38.1 +60.0 144.6	17 49.1 +60.0 144.8	17 00.0 +60.0 145.0	17	22 41.1 +59.8 143.5	21 52.7 +59.8 143.7	22 04.2 +59.9 143.9	21 15.6 +60.0 144.2	20 26.9 +60.0 144.4	19 38.1 +60.0 144.6	18 49.1 +60.0 144.8	18 00.0 +60.0 145.0	18	0	0	0	0	0	0	0
19	24 40.7 +59.9 143.4	23 52.5 +59.9 143.6	23 04.1 +59.9 143.9	22 15.6 +59.9 144.1	21 26.9 +60.0 144.4	20 38.1 +60.0 144.5	19 49.1 +60.0 144.8	19 00.0 +60.0 145.0	19	25 40.6 +59.8 143.3	24 52.4 +59.8 143.6	24 04.0 +59.9 143.8	23 15.5 +60.0 144.1	22 26.9 +59.9 144.3	21 38.0 +60.0 144.6	20 49.1 +60.0 144.8	20 00.0 +60.0 145.0	20	0	0	0	0	0	0	0
20	25 40.6 +59.8 143.3	24 52.2 +59.9 143.5	24 03.9 +59.9 143.8	23 15.5 +60.0 144.1	22 26.8 +60.0 144.3	21 38.0 +60.0 144.6	20 49.1 +60.0 144.8	20 00.0 +60.0 145.0	21	26 40.4 +59.8 143.2	25 52.0 +59.8 143.4	26 03.8 +60.0 143.7	25 15.4 +59.9 144.0	24 26.8 +60.0 144.3	23 38.0 +60.0 144.5	22 49.1 +60.0 144.8	22 00.0 +60.0 145.0	22	0	0	0	0	0	0	0
22	27 40.2 +59.8 143.1	26 51.1 +59.9 143.4	26 03.8 +60.0 143.7	25 15.4 +59.9 144.0	24 26.8 +60.0 144.3	23 38.0 +60.0 144.5	22 49.1 +60.0 144.8	22 00.0 +60.0 145.0	23	28 40.0 +59.8 143.0	27 52.0 +59.8 143.3	27 03.8 +59.9 143.6	26 15.3 +60.0 143.9	25 26.8 +59.9 144.2	24 38.0 +60.0 144.5	23 49.1 +60.0 144.8	23 00.0 +60.0 145.0	23	0	0	0	0	0	0	0
23	29 39.8 +59.8 142.9	28 51.8 +59.9 143.0	28 03.7 +59.9 143.6	27 15.3 +59.9 143.9	26 26.7 +60.0 144.2	25 38.0 +60.0 144.5	24 49.1 +60.0 144.7	24 00.0 +60.0 145.0	24	29 39.8 +59.8 142.9	29 51.7 +59.8 143.2	29 03.6 +59.9 143.5	28 15.2 +60.0 143.8	27 26.7 +60.0 144.1	26 38.0 +60.0 144.4	25 49.1 +60.0 144.7	25 00.0 +60.0 145.0	25	0	0	0	0	0	0	0
25	30 39.6 +59.8 142.8	29 51.5 +59.8 143.2	29 03.6 +59.9 143.5	28 15.2 +60.0 143.8	27 26.7 +60.0 144.1	26 38.0 +60.0 144.4	25 49.1 +60.0 144.7	25 00.0 +60.0 145.0	26	31 39.4 +59.8 142.7	30 51.5 +59.9 143.1	30 03.5 +59.9 143.4	29 15.2 +59.9 143.8	28 26.7 +59.9 144.1	27 38.0 +59.9 144.4	26 49.1 +60.0 144.7	26 00.0 +60.0 145.0	26	0	0	0	0	0	0	0
26	32 39.2 +59.8 142.6	31 51.4 +59.8 143.0	31 03.4 +59.9 143.4	30 15.1 +59.9 143.7	29 26.6 +60.0 144.1	28 37.9 +60.0 144.4	27 49.1 +60.0 144.7	27 00.0 +60.0 145.0	27	33 39.0 +59.8 142.5	32 51.2 +59.9 142.9	32 03.3 +59.9 143.6	31 15.0 +60.0 143.7	30 26.6 +59.9 144.0	29 37.9 +60.0 144.3	28 49.1 +60.0 144.7	28 00.0 +60.0 145.0	28	0	0	0	0	0	0	0
28	34 38.8 +59.8 142.4	33 51.1 +59.8 142.8	33 03.1 +59.9 143.2	32 15.0 +59.9 143.6	31 25.6 +60.0 144.3	30 37.9 +60.0 144.5	29 49.1 +60.0 144.8	29 00.0 +60.0 145.0	29	35 38.6 +59.7 142.3	34 50.9 +59.8 142.8	34 03.0 +59.9 143.2	33 14.9 +59.9 143.6	32 26.5 +60.0 143.9	31 37.9 +60.0 144.3	30 49.0 +60.0 144.7	30 00.0 +60.0 145.0	30	0	0	0	0	0	0	0
30	35 38.6 +59.7 142.3	34 50.9 +59.8 142.8	34 03.0 +59.9 143.2	33 14.9 +59.9 143.6	32 26.5 +60.0 143.9	31 37.9 +60.0 144.3	30 49.0 +60.0 144.7	30 00.0 +60.0 145.0	31	36 38.3 +59.6 142.2	35 50.8 +59.8 142.7	35 02.9 +59.9 143.1	34 14.8 +60.0 143.5	33 26.5 +59.9 143.9	32 37.9 +60.0 144.3	31 49.0 +60.0 144.6	31 00.0 +60.0 145.0	31	0	0	0	0	0	0	0
32	37 38.1 +59.8 142.1	36 50.6 +59.8 142.6	36 02.8 +59.9 143.0	35 14.8 +59.9 143.4	34 26.4 +60.0 143.9	33 37.9 +59.9 144.3	32 49.0 +60.0 144.6	32 00.0 +60.0 145.0	32	33 37.9 +59.7 142.0	37 50.4 +59.8 142.5	37 02.7 +59.9 142.9	36 15.1 +59.9 143.2	35 26.4 +60.0 143.8	34 37.8 +60.0 144.2	33 49.0 +60.0 144.6	33 00.0 +60.0 145.0	33	0	0	0	0	0	0	0
34	39 37.6 +59.8 141.9	38 50.3 +59.8 142.3	38 02.6 +59.9 142.4	37 14.6 +59.9 141.9	36 25.8 +59.9 142.5	35 37.6 +60.0 143.2	34 49.0 +60.0 144.4	34 00.0 +60.0 145.0	34	40 37.4 +59.7 141.8	41 50.1 +59.8 142.8	40 02.3 +59.9 142.													

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 35°, 325°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	5 43.8 -59.9 144.8	4 54.7 -59.9 144.9	4 05.6 -59.9 144.9	3 16.5 -59.9 144.9	2 27.4 -59.9 145.0	1 38.3 -60.0 145.0	0 49.1 -59.9 145.0	0 00.0 +60.0 35.0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	4 43.9 -59.8 144.9	3 54.8 -59.9 144.9	3 05.7 -59.9 144.9	2 16.6 -60.0 145.0	1 27.5 -60.0 145.0	0 38.3 -60.0 145.0	0 10.8 +60.0 35.0	1 00.0 +60.0 35.0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
2	3 44.1 -59.9 144.9	2 54.9 -59.9 145.0	2 05.8 -59.9 145.0	1 16.6 -59.9 145.0	0 27.5 -60.0 145.0	0 21.7 +60.0 35.0	1 10.8 +60.0 35.0	2 00.0 +60.0 35.0	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
3	2 44.2 -59.8 145.0	1 55.0 -59.9 145.0	1 05.9 -60.0 145.0	0 16.7 -60.0 145.1	0 43.3 +59.9 34.9	1 32.5 +59.9 34.9	2 21.7 +59.9 34.9	3 10.8 +60.0 35.0	3	4	5	6	7	8	9	10	11	12	13	14	15				
4	1 44.4 -59.9 145.1	0 55.1 -59.8 145.1	0 04.7 +59.9 34.8	0 54.0 +59.9 34.9	1 43.2 +60.0 34.9	2 32.4 +60.0 34.9	3 21.6 +60.0 34.9	4 10.8 +60.0 35.0	4	5	6	7	8	9	10	11	12	13	14	15					
5	0 44.5 -59.9 145.1								0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
6	0 15.4 +59.8 34.8	1 04.6 +59.9 34.8	1 53.9 +59.8 34.8	2 43.2 +59.9 34.8	3 32.4 +60.0 34.9	4 21.6 +60.0 34.9	5 10.8 +60.0 34.9	6 00.0 +60.0 35.0	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
7	1 15.2 +59.9 34.7	2 04.5 +59.9 34.7	2 53.8 +60.0 34.8	3 43.1 +60.0 34.8	4 32.4 +60.0 34.8	5 21.6 +60.0 34.9	6 10.8 +60.0 34.9	7 00.0 +60.0 35.0	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
8	2 15.1 +59.8 34.6	3 04.4 +59.9 34.7	3 53.8 +59.9 34.7	4 43.1 +59.9 34.7	5 32.4 +59.9 34.8	6 21.6 +60.0 34.9	7 10.8 +60.0 34.9	8 00.0 +60.0 35.0	8	9	10	11	12	13	14	15	16	17	18	19	20				
9	3 14.9 +59.9 34.6	4 04.3 +59.9 34.6	4 53.7 +59.9 34.7	5 43.0 +60.0 34.7	6 32.3 +60.0 34.8	7 21.6 +60.0 34.8	8 10.8 +60.0 34.9	9 00.0 +60.0 35.0	9	10	11	12	13	14	15	16	17	18	19	20					
10	4 14.8 +59.8 34.5	5 04.2 +59.9 34.5	5 53.6 +59.9 34.6	6 43.0 +59.9 34.7	7 32.3 +60.0 34.7	8 21.6 +60.0 34.8	9 10.8 +60.0 34.9	10 00.0 +60.0 35.0	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
11	5 14.6 +59.9 34.4	6 04.1 +59.9 34.5	6 53.5 +60.0 34.6	7 42.9 +60.0 34.6	8 32.3 +59.9 34.7	9 21.6 +60.0 34.8	10 10.8 +60.0 34.9	11 00.0 +60.0 35.0	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
12	6 14.5 +59.8 34.4	7 04.0 +59.9 34.4	7 53.5 +59.9 34.5	8 42.9 +59.9 34.6	9 32.2 +60.0 34.7	10 21.6 +60.0 34.8	11 10.8 +60.0 34.9	12 00.0 +60.0 35.0	12	13	14	15	16	17	18	19	20	21	22	23	24				
13	7 14.3 +59.9 34.3	8 03.9 +59.9 34.4	8 53.4 +59.9 34.4	9 42.8 +60.0 34.5	10 32.2 +60.0 34.6	11 21.6 +59.9 34.8	12 10.8 +60.0 34.9	13 00.0 +60.0 35.0	13	14	15	16	17	18	19	20	21	22	23	24					
14	8 14.2 +59.8 34.2	9 03.8 +59.9 34.3	9 53.3 +59.9 34.4	10 42.8 +59.9 34.5	11 32.2 +60.0 34.6	12 21.5 +60.0 34.7	13 10.8 +60.0 34.9	14 00.0 +60.0 35.0	14	15	16	17	18	19	20	21	22	23	24						
15	9 14.0 +59.9 34.1	10 03.7 +59.8 34.2	10 53.2 +59.9 34.3	11 42.7 +60.0 34.5	12 32.2 +59.9 34.6	13 21.5 +60.0 34.7	14 10.8 +60.0 34.9	15 00.0 +60.0 35.0	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
16	10 13.9 +59.8 34.1	11 03.5 +59.9 34.2	11 53.1 +60.0 34.3	12 42.7 +59.9 34.4	13 32.1 +60.0 34.5	14 21.5 +60.0 34.7	15 10.8 +60.0 34.8	16 00.0 +60.0 35.0	16	17	18	19	20	21	22	23	24	25	26	27	28				
17	11 13.7 +59.9 34.0	12 03.4 +59.9 34.1	12 53.1 +59.9 34.2	13 42.6 +60.0 34.4	14 32.1 +60.0 34.5	15 21.5 +60.0 34.7	16 10.8 +60.0 34.8	17 00.0 +60.0 35.0	17	18	19	20	21	22	23	24	25	26	27	28					
18	12 13.6 +59.8 33.9	13 03.3 +59.9 34.1	13 53.0 +59.9 34.2	14 42.6 +59.9 34.3	15 32.1 +59.9 34.5	16 21.5 +60.0 34.6	17 10.8 +60.0 34.8	18 00.0 +60.0 35.0	18	19	20	21	22	23	24	25	26	27	28						
19	13 13.4 +59.9 33.9	14 03.2 +59.9 34.0	14 52.9 +59.9 34.1	15 42.5 +60.0 34.3	16 32.0 +60.0 34.5	17 21.5 +60.0 34.6	18 10.8 +60.0 34.8	19 00.0 +60.0 35.0	19	20	21	22	23	24	25	26	27	28							
20	14 13.3 +59.8 33.8	15 03.1 +59.9 33.9	15 52.8 +59.9 34.1	16 42.5 +59.9 34.2	17 32.0 +60.0 34.4	18 21.5 +59.9 34.6	19 10.8 +60.0 34.8	20 00.0 +60.0 35.0	20	21	22	23	24	25	26	27	28								
21	15 13.1 +59.8 33.7	16 03.0 +59.9 33.9	16 52.7 +60.0 34.0	17 42.4 +60.0 34.2	18 32.0 +60.0 34.4	19 21.4 +60.0 34.6	20 10.8 +60.0 34.8	21 00.0 +60.0 35.0	21	22	23	24	25	26	27	28									
22	16 12.9 +59.9 33.6	17 02.9 +59.8 33.8	17 52.7 +59.9 34.0	18 42.4 +59.9 34.2	19 32.0 +59.9 34.4	20 21.4 +60.0 34.5	21 10.8 +60.0 34.8	22 00.0 +60.0 35.0	22	23	24	25	26	27	28										
23	17 12.8 +59.8 33.6	18 02.7 +59.9 33.7	18 52.6 +59.9 33.9	19 42.3 +60.0 34.1	20 31.9 +60.0 34.3	21 21.4 +60.0 34.5	22 10.8 +60.0 34.8	23 00.0 +60.0 35.0	23	24	25	26	27	28											
24	18 12.6 +59.9 33.5	19 02.6 +59.9 33.7	19 52.5 +59.9 33.9	20 42.3 +59.9 34.1	21 31.9 +60.0 34.3	22 21.4 +60.0 34.5	23 10.8 +60.0 34.8	24 00.0 +60.0 35.0	24	25	26	27	28												
25	19 12.5 +59.8 33.4	20 02.5 +59.9 33.6	20 52.4 +59.9 33.8	21 42.2 +59.9 34.0	22 31.9 +59.9 34.2	23 21.4 +60.0 34.5	24 10.8 +60.0 34.7	25 00.0 +60.0 35.0	25	26	27	28													
26	20 12.3 +59.8 33.3	21 02.4 +59.8 33.5	21 52.3 +59.9 33.7	22 42.1 +60.0 34.0	23 31.8 +60.0 34.2	24 21.4 +60.0 34.5	25 10.8 +60.0 34.7	26 00.0 +60.0 35.0	26	27	28														
27	21 12.1 +59.9 33.2	22 02.2 +59.9 33.5	22 52.2 +59.9 33.7	23 42.1 +59.9 33.9	24 31.8 +60.0 34.2	25 21.4 +59.9 34.4	26 10.8 +60.0 34.7	27 00.0 +60.0 35.0	27	28															
28	22 12.0 +59.8 33.2	23 02.1 +59.9 33.4	23 52.1 +60.0 33.6	24 42.0 +60.0 33.9	25 31.8 +59.9 34.1	26 21.3 +60.0 34.4	27 10.8 +60.0 34.7	28 00.0 +60.0 35.0	28																
29	23 11.8 +59.8 33.1	24 02.0 +59.9 33.3	24 52.1 +59.9 33.6	25 42.0 +59.9 33.8	26 31.7 +60.0 34.1	27 21.3 +60.0 34.4	28 10.8 +60.0 34.5	29 00.0 +60.0 35.0	29																
30	24 11.6 +59.8 33.0	25 01.9 +59.8 33.2	25 52.0 +59.9 33.5	26 41.9 +60.0 33.8	27 31.7 +60.0 34.1	28 21.3 +60.0 34.4	29 10.8 +59.9 34.7	30 00.0 +60.0 35.0	30																
31	25 11.4 +59.8 32.9	26 01.7 +59.9 33.2	26 51.9 +59.9 33.4	27 41.9 +59.9 33.7	28 31.7 +59.9 34.0	29 21.3 +60.0 34.3	30 10.7 +60.0 34.7	31 00.0 +60.0 35.0	31																
32	26 11.2 +59.9 32.8	27 01.6 +59.9 33.1	27 51.8 +59.9 33.4	28 41.8 +59.9 33.7	29 31.6 +60.0 34.0	30 21.3 +60.0 34.3	31 10.7 +60.0 34.6	32 00.0 +60.0 35.0	32																
33	27 11.1 +59.8 32.7	28 01.5 +59.8 33.0	28 51.7 +59.9 33.3	29 41.7 +60.0 33.6	30 31.6 +60.0 33.9	31 21.3 +60.0 34.3	32 10.7 +60.0 34.6	33 00.0 +60.0 35.0	33																
34	28 10.9 +59.8 32.6	29 01.3 +59.9 32.9	29 51.6 +59.9 33.3	30 41.7 +59.9 33.6	31 31.6 +59.9 33.9	32 21.3 +59.9 34.3	33 10.7 +60.0 34.6	34 00.0 +60.0 35.0	34																
35	29 10.7 +59.8 32.6	30 01.2 +59.8 32.9	30 51.5 +59.9 33.2	31 41.6 +59.9 33.5	32 31.5 +60.0 33.9	33 21.2 +60.0 34.2	34 10.7 +60.0 34.6	35 00.0 +60.0 35.0	35																
36	30 10.5 +59.8 32.5	31 01.0 +59.9 32.8	31 51.4 +59.9 33.1	32 41.5 +60.0 33.5	33 31.5 +59.9 33.8	34 21.2 +60.0 34.2	35 10.7 +60.0 34.6	36 00.0 +60.0 35.0	36																
37	31 10.3 +59.8 32.4	32 00.9 +59.8 32.7	32 51.3 +59.9 33.0	33 41.4 +59.9 33.4	34 31.4 +60.0 33.8	35 21.2 +60.0 34.2	36 10.7 +60.0 34.6	37 00.0 +60.0 35.0	37																
38	32 10.1 +59.8 32.3	33 00.7 +59.9 32.6	33 51.2 +59.9 33.0	34 41.4 +59.9 33.3	35 31.4 +60.0 33.7	36 21.2 +60.0 34.1	37 10.7 +60.0 34.6	38 00.0 +60.0 35.0	38																
39	33 09.9 +59.8 32.2	34 00.6 +59.8 32.5	34 51.1 +59.8 32.9	35 41.3 +59.9 33.3	36 31.4 +59.9 33.7	37 21.2 +59.9 34.1	38 10.7 +60.0 34.5	39 00.0 +60.0 35.0	39																
40	34 09.7 +59.8 32.1	35 00.4 +59.8 32.4	35 50.9 +59.9 32.8	36 41.2 +60.0 33.2	37 31.3 +60.0 33.6	38 21.1 +60.0 34.1	39 10.7 +60.0 34.5	40 00.0 +60.0 35.0	40																
41	35 09.5 +59.7 32.0	36 00.2 +59.9 32.4	36 50.8 +59.9 32.7	37																					

36°, 324° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	Dec.				
0	5	39.5	+59.8	143.8	4	51.1	+59.8	143.9	4	02.6	+59.9	143.9	3	14.1	+60.0	143.9	2	25.6	+60.0	144.0	1	37.1	+60.0	144.0	0	00.0	+60.0	144.0	0
1	6	39.3	+59.9	143.7	5	50.9	+59.9	143.8	5	02.5	+59.9	143.8	4	14.1	+59.9	143.9	3	25.6	+59.9	143.9	2	37.1	+59.9	144.0	1	48.5	+60.0	144.0	1
2	7	39.2	+59.8	143.7	6	50.8	+59.9	143.7	6	02.4	+60.0	143.8	5	14.0	+60.0	143.9	4	25.5	+60.0	143.9	3	37.0	+60.0	143.9	2	48.5	+60.0	144.0	2
3	8	39.0	+59.8	143.6	7	50.7	+59.9	143.7	7	02.4	+59.9	143.7	6	14.0	+59.9	143.8	5	25.5	+60.0	143.9	4	37.0	+60.0	143.9	3	48.5	+60.0	144.0	3
4	9	38.9	+59.8	143.5	8	50.6	+59.9	143.6	8	02.3	+59.9	143.7	7	13.9	+60.0	143.8	6	25.5	+60.0	143.8	5	37.0	+60.0	143.9	4	48.5	+60.0	144.0	4
5	10	38.7	+59.8	143.4	9	50.5	+59.9	143.5	9	02.2	+59.9	143.6	8	13.9	+59.9	143.7	7	25.5	+59.9	143.8	6	37.0	+60.0	143.9	5	48.5	+60.0	144.0	5
6	11	38.5	+59.9	143.4	10	50.4	+59.9	143.5	10	02.1	+59.9	143.6	9	13.8	+60.0	143.7	8	25.4	+60.0	143.8	7	37.0	+60.0	143.9	6	48.5	+60.0	144.0	6
7	12	38.4	+59.8	143.3	11	50.3	+59.8	143.4	11	02.0	+60.0	143.5	10	13.8	+59.9	143.6	9	25.4	+60.0	143.7	8	37.0	+60.0	143.8	7	48.5	+60.0	144.0	7
8	13	38.2	+59.8	143.2	12	50.1	+59.9	143.3	12	02.0	+59.9	143.5	11	13.7	+59.9	143.6	10	25.4	+59.9	143.7	9	37.0	+60.0	143.8	8	48.5	+60.0	144.0	8
9	14	38.1	+59.8	143.1	13	50.0	+59.9	143.3	13	01.9	+59.9	143.4	12	13.6	+60.0	143.6	11	25.3	+60.0	143.7	10	37.0	+59.9	143.8	9	48.5	+60.0	144.0	9
10	15	37.9	+59.8	143.1	14	49.9	+59.9	143.2	14	01.8	+59.9	143.4	13	13.6	+59.9	143.5	12	25.3	+60.0	143.6	11	36.9	+60.0	143.8	10	48.5	+60.0	143.9	10
11	16	37.7	+59.9	143.0	15	49.8	+59.8	143.1	15	01.7	+59.9	143.3	14	13.5	+60.0	143.5	13	25.3	+60.0	143.6	12	36.9	+60.0	143.8	11	48.5	+60.0	144.0	11
12	17	37.6	+59.8	142.9	16	49.6	+59.9	143.1	16	01.6	+59.9	143.3	15	13.5	+59.9	143.4	14	25.3	+60.0	143.6	13	36.9	+60.0	143.7	12	48.5	+60.0	144.0	12
13	18	37.4	+59.8	142.8	17	49.5	+59.9	143.0	17	01.5	+59.9	143.2	16	13.4	+60.0	143.4	15	25.2	+60.0	143.6	14	36.9	+60.0	143.9	13	48.5	+60.0	144.0	13
14	19	37.2	+59.8	142.7	18	49.4	+59.9	142.9	18	01.4	+60.0	143.1	17	13.4	+59.9	143.3	16	25.2	+60.0	143.7	15	36.9	+60.0	143.8	14	48.5	+60.0	144.0	14
15	20	37.0	+59.9	142.7	19	49.3	+59.8	142.9	19	01.4	+59.9	143.1	18	13.3	+60.0	143.3	17	25.2	+59.9	143.5	16	36.9	+60.0	143.7	15	48.5	+60.0	144.0	15
16	21	36.9	+59.8	142.6	20	49.1	+59.9	142.8	20	01.3	+59.9	143.0	19	13.3	+59.9	143.2	18	25.1	+60.0	143.5	17	36.9	+60.0	143.6	16	48.5	+60.0	144.0	16
17	22	36.7	+59.8	142.5	21	49.0	+59.9	142.7	21	01.2	+59.9	143.0	20	13.2	+59.9	143.2	19	25.1	+60.0	143.4	18	36.9	+59.9	143.6	17	48.5	+60.0	144.0	17
18	23	36.5	+59.8	142.4	22	48.9	+59.8	142.7	22	01.1	+59.9	142.9	21	13.1	+60.0	143.2	20	25.1	+59.9	143.4	19	36.8	+60.0	143.6	18	48.5	+60.0	144.0	18
19	24	36.3	+59.8	142.3	23	48.7	+59.9	142.6	23	01.0	+59.9	142.9	22	13.1	+59.9	143.1	21	25.0	+60.0	143.3	20	36.8	+60.0	143.6	19	48.5	+60.0	144.0	19
20	25	36.1	+59.8	142.2	24	48.6	+59.9	142.5	24	00.9	+59.9	142.8	23	13.0	+60.0	143.1	22	25.0	+60.0	143.3	21	36.8	+60.0	143.6	20	48.5	+60.0	144.0	20
21	26	35.9	+59.8	142.1	25	48.5	+59.8	142.4	25	00.8	+59.9	142.7	24	13.0	+59.9	143.0	23	25.0	+59.9	143.3	22	36.8	+60.0	143.5	21	48.5	+60.0	144.0	21
22	27	35.7	+59.8	142.1	26	48.3	+59.9	142.4	26	00.7	+59.9	142.7	25	12.9	+59.9	143.0	24	24.9	+60.0	143.2	23	36.8	+60.0	143.5	22	48.5	+60.0	144.0	22
23	28	35.5	+59.8	142.0	27	48.2	+59.8	142.3	27	00.6	+59.9	142.6	26	12.8	+60.0	142.9	25	24.9	+60.0	143.2	24	36.8	+59.9	143.5	23	48.5	+60.0	144.0	23
24	29	35.3	+59.8	141.9	28	48.0	+59.9	142.2	28	00.5	+59.9	142.5	27	12.8	+59.9	142.9	26	24.9	+60.0	143.2	25	36.7	+60.0	143.5	24	48.5	+60.0	144.0	24
25	30	35.1	+59.8	141.8	29	47.9	+59.8	142.1	29	00.4	+59.9	142.5	28	12.7	+60.0	142.8	27	24.8	+60.0	143.1	26	36.7	+60.0	143.4	25	48.5	+60.0	144.0	25
26	31	34.9	+59.8	141.7	30	47.7	+59.8	142.0	30	00.3	+59.9	142.4	29	12.7	+59.9	142.8	28	24.8	+60.0	143.1	27	36.7	+60.0	143.4	26	48.5	+59.9	144.0	26
27	32	34.7	+59.8	141.6	31	47.6	+59.8	142.0	31	00.2	+59.9	142.3	30	12.6	+59.9	142.7	29	24.8	+59.9	143.0	28	36.7	+60.0	143.4	27	48.4	+60.0	144.0	27
28	33	34.5	+59.8	141.5	32	47.4	+59.9	141.9	32	00.1	+59.9	142.3	31	12.5	+60.0	142.6	30	24.7	+60.0	143.0	29	36.7	+60.0	143.3	28	48.4	+60.0	144.0	28
29	34	34.3	+59.7	141.4	33	47.3	+59.8	141.8	33	00.0	+59.9	142.2	32	12.5	+59.9	142.6	31	24.7	+59.9	143.0	30	36.7	+60.0	143.3	29	48.4	+60.0	144.0	29
30	35	34.0	+59.8	141.3	34	47.1	+59.8	141.7	33	59.9	+59.9	142.1	33	12.4	+59.9	142.5	32	24.6	+60.0	142.9	31	36.7	+59.9	143.3	30	48.4	+60.0	144.0	30
31	36	33.8	+59.8	141.2	35	46.9	+59.8	141.6	34	59.8	+59.8	142.0	33	12.3	+59.9	142.5	32	24.6	+60.0	142.9	31	36.6	+60.0	143.3	31	48.4	+60.0	144.0	31
32	37	33.6	+59.7	141.0	36	46.7	+59.9	141.5	35	59.6	+59.9	142.0	34	12.2	+60.0	142.4	33	24.6	+59.9	142.8	32	36.6	+60.0	143.6	32	48.4	+60.0	144.0	33
33	38	33.3	+59.8	140.9	37	46.6	+59.8	141.4	36	59.5	+59.9	141.9	35	12.2	+59.9	142.3	34	24.5	+60.0	142.8	33	36.6	+60.0	143.6	33	48.4	+60.0	144.0	34
34	39	33.1	+59.7	140.8	38	46.4	+59.8	140.0	37	59.4	+59.8	140.7	36	11.0	+59.9	141.4	35	23.9	+59.9	142.1	34	36.6	+60.0	143.2	33	48.4	+60.0	144.0	35
35	40	32.8	+59.7	140.7	39	46.2	+59.8	141.2	38	59.3	+59.8	141.7	37	12.0	+59.9	142.2	36	24.4	+60.0	142.7	35	36.6	+59.9	143.1	34	48.4	+60.0	144.0	35
36	41	32.5	+59.7	140.6	40	46.0	+59.8	141.1	39	59.1	+59.9	141.6	38	11.9	+59.9	142.1	37	24.3	+59.9	142.6	36	36.5	+60.0	143.1	35	48.4	+60.0	144.0	36
37	42	32.2	+59.7	140.4	41	45.8	+59.8																						

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 36°, 324°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	5	39.5	-59.9	143.8	4	51.1	-59.9	143.9	4	02.6	-59.9	143.9	3	14.1	-59.9	143.9	2	25.6	-60.0	144.0	1	37.1	-60.0	144.0	0	48.5	-60.0	144.0	0	0.00	+60.0	36.0	0
1	4	39.6	-59.8	143.9	3	51.2	-59.9	143.9	3	02.7	-59.9	143.9	2	14.2	-60.0	144.0	1	25.6	-59.9	144.0	0	37.1	-60.0	144.0	0	11.5	+60.0	36.0	1				
2	3	39.8	-59.8	143.9	2	51.3	-59.9	144.0	2	02.8	-60.0	144.0	1	14.2	-59.9	144.0	0	25.7	-60.0	144.0	0	22.9	+60.0	36.0	2								
3	2	40.0	-59.9	144.0	1	51.4	-59.9	144.0	1	02.8	-59.9	144.1	0	14.3	-60.0	144.1	0	34.3	+60.0	35.9	1	22.9	+60.0	36.0	3								
4	1	40.1	-59.8	144.1	0	51.5	-59.9	144.1	0	02.9	-59.9	144.1	0	45.7	+59.9	35.9	1	34.3	+60.0	35.9	2	22.9	+60.0	35.9	4								
5	0	40.3	-59.9	144.2	0	08.4	+59.9	35.8	0	57.0	+59.9	35.8	1	45.6	+60.0	35.9	2	34.3	+59.9	35.9	3	22.9	+59.9	35.9	4	11.4	+60.0	36.0	5				
6	0	19.6	+59.8	35.8	1	08.3	+59.8	35.8	1	56.9	+59.9	35.8	2	45.6	+59.9	35.8	3	34.2	+60.0	35.9	4	22.8	+60.0	35.9	5	11.4	+60.0	36.0	6				
7	1	19.4	+59.9	35.7	2	08.1	+59.9	35.7	2	56.8	+60.0	35.7	3	45.5	+60.0	35.8	4	34.2	+60.0	35.8	5	22.8	+60.0	35.9	6	11.4	+60.0	36.0	7				
8	2	19.3	+59.8	35.6	3	08.0	+59.9	35.7	3	56.8	+59.9	35.7	4	45.5	+59.9	35.7	5	34.2	+59.9	35.8	6	22.8	+60.0	35.9	7	11.4	+60.0	36.0	8				
9	3	19.1	+59.9	35.6	4	07.9	+59.9	35.6	4	56.7	+59.9	35.6	5	45.4	+60.0	35.7	6	34.1	+60.0	35.8	7	22.8	+60.0	35.8	8	11.4	+60.0	36.0	9				
10	4	19.0	+59.8	35.5	5	07.8	+59.9	35.5	5	56.6	+59.9	35.6	6	45.4	+59.9	35.7	7	34.1	+60.0	35.7	8	22.8	+60.0	35.8	9	11.4	+60.0	35.9	10				
11	5	18.8	+59.8	35.4	6	07.7	+59.9	35.5	6	56.5	+60.0	35.5	7	45.3	+60.0	35.6	8	34.1	+60.0	35.7	9	22.8	+60.0	35.8	10	11.4	+60.0	35.9	11				
12	6	18.6	+59.9	35.3	7	07.6	+59.9	35.4	7	56.5	+59.9	35.5	8	45.3	+60.0	35.6	9	34.1	+59.9	35.7	10	22.8	+60.0	35.8	11	11.4	+60.0	36.0	12				
13	7	18.5	+59.8	35.3	8	07.5	+59.8	35.3	8	56.4	+59.9	35.4	9	45.2	+60.0	35.5	10	34.0	+60.0	35.6	11	22.8	+59.9	35.7	12	11.4	+60.0	35.9	13				
14	8	18.3	+59.9	35.2	9	07.3	+59.9	35.3	9	56.3	+59.9	35.4	10	45.2	+59.9	35.5	11	34.0	+60.0	35.6	12	22.7	+60.0	35.7	13	11.4	+60.0	36.0	14				
15	9	18.2	+59.8	35.1	10	07.2	+59.9	35.2	10	56.2	+59.9	35.3	11	45.1	+60.0	35.4	12	34.0	+59.9	35.6	13	22.7	+60.0	35.7	14	11.4	+60.0	35.8	15				
16	10	18.0	+59.9	35.0	11	07.1	+59.9	35.2	11	56.1	+59.9	35.3	12	45.1	+59.9	35.4	13	33.9	+60.0	35.5	14	22.7	+60.0	35.7	15	11.4	+60.0	35.8	16				
17	11	17.9	+59.8	35.0	12	07.0	+59.9	35.1	12	56.0	+60.0	35.2	13	45.0	+60.0	35.4	14	33.9	+60.0	35.5	15	22.7	+60.0	35.7	16	11.4	+60.0	35.8	17				
18	12	17.7	+59.8	34.9	13	06.9	+59.8	35.0	13	56.0	+59.9	35.2	14	45.0	+59.9	35.3	15	33.9	+59.9	35.6	16	22.7	+60.0	35.7	17	11.4	+60.0	35.8	18				
19	13	17.5	+59.9	34.8	14	06.7	+59.9	35.0	14	55.9	+59.9	35.1	15	44.9	+60.0	35.3	16	33.8	+60.0	35.4	17	22.7	+60.0	35.6	18	11.4	+60.0	35.8	19				
20	14	17.4	+59.8	34.7	15	06.6	+59.9	34.9	15	55.8	+59.9	35.1	16	44.9	+59.9	35.2	17	33.8	+60.0	35.4	18	22.7	+59.9	35.6	19	11.4	+60.0	35.8	20				
21	15	17.2	+59.8	34.7	16	06.5	+59.9	34.8	16	55.7	+59.9	35.0	17	44.8	+59.9	35.2	18	33.8	+60.0	35.4	19	22.6	+60.0	35.6	20	11.4	+60.0	35.8	21				
22	16	17.0	+59.9	34.6	17	06.4	+59.8	34.8	17	55.6	+59.9	34.9	18	44.7	+60.0	35.1	19	33.8	+59.9	35.3	20	22.6	+60.0	35.5	21	11.4	+60.0	35.8	22				
23	17	16.9	+59.8	34.5	18	06.3	+59.8	34.7	18	55.5	+59.9	34.9	19	44.7	+59.9	35.1	20	33.7	+60.0	35.3	21	22.6	+60.0	35.5	22	11.4	+60.0	35.8	23				
24	18	16.7	+59.8	34.4	19	06.1	+59.9	34.6	19	55.4	+60.0	34.8	20	44.6	+60.0	35.0	21	33.7	+60.0	35.3	22	22.6	+60.0	35.5	23	11.4	+60.0	36.0	24				
25	19	16.5	+59.9	34.4	20	06.0	+59.9	34.6	20	55.4	+59.9	34.8	21	44.6	+59.9	35.0	22	33.7	+59.9	35.2	23	22.6	+60.0	35.5	24	11.4	+60.0	35.8	25				
26	20	16.4	+59.8	34.3	21	05.9	+59.8	34.5	21	55.3	+59.9	34.7	22	44.5	+60.0	34.9	23	33.6	+60.0	35.2	24	22.6	+60.0	35.5	25	11.4	+60.0	36.0	26				
27	21	16.2	+59.8	34.2	22	05.7	+59.9	34.4	22	55.2	+59.9	34.7	23	44.5	+59.9	34.9	24	33.6	+60.0	35.2	25	22.6	+59.9	35.4	26	11.4	+60.0	36.0	27				
28	22	16.0	+59.8	34.1	23	05.6	+59.9	34.3	23	55.1	+59.9	34.6	24	44.4	+59.9	34.9	25	33.6	+59.9	35.1	26	22.5	+60.0	35.4	27	11.4	+60.0	36.0	28				
29	23	15.8	+59.8	34.0	24	05.5	+59.8	34.3	24	55.0	+59.9	34.5	25	44.3	+60.0	34.8	26	33.5	+60.0	35.1	27	22.5	+60.0	35.4	28	11.4	+60.0	36.0	29				
30	24	15.6	+59.9	33.9	25	05.3	+59.9	34.2	25	54.9	+59.9	34.5	26	44.3	+59.9	34.7	27	33.5	+59.9	35.0	28	22.5	+60.0	35.3	29	11.4	+60.0	35.8	30				
31	25	15.5	+59.8	33.9	26	05.2	+59.9	34.1	26	54.8	+59.9	34.4	27	44.2	+59.9	34.7	28	33.4	+60.0	35.0	29	22.5	+60.0	35.3	31	11.3	+60.0	36.0	31				
32	26	15.3	+59.8	33.8	27	05.1	+59.8	34.0	27	54.7	+59.9	34.3	28	44.1	+60.0	34.6	29	33.4	+60.0	35.0	30	22.5	+60.0	35.3	32	11.3	+60.0	36.0	32				
33	27	15.1	+59.8	33.7	28	04.9	+59.9	34.0	28	54.6	+59.9	34.3	29	44.1	+59.9	34.6	30	33.4	+59.9	34.9	31	22.5	+59.9	35.3	32	11.3	+60.0	36.0	33				
34	28	14.9	+59.8	33.6	29	04.8	+59.8	33.9	29	54.5	+59.9	34.2	30	44.0	+59.9	34.5	31	33.3	+60.0	34.9	32	22.4	+60.0	35.2	33	11.3	+60.0	36.0	34				
35	29	14.7	+59.8	33.5	30	04.6	+59.9	33.8	30	54.4	+59.9	34.1	31	43.9	+60.0	34.5	32	33.3	+60.0	34.8	33	22.4	+60.0	35.2	34	11.3	+60.0	36.0	35				
36	30	14.5	+59.8	33.4	31	04.5	+59.8	33.7	31	54.3	+59.9	34.1	32	43.9	+59.9	34.4	33	33.3	+59.9	34.8	34	22.4	+60.0	35.2	35	11.3	+60.0	36.0	36				
37	31	14.3	+59.7	33.3	32	04.3	+59.8	33.6	32	54.2	+59.8	34.0	33	43.8	+59.9	34.3	34	33.2	+60.0	34.7	35	22.4	+60.0	35.6	36	11.3	+60.0	36.0	37				
38</																																	

37°, 323° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.	
Dec.	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	Dec.	
0	5	35.1	+59.9	142.8	4	47.3	+59.9	142.8	3	59.5	+59.9	142.9	3	11.6	+60.0	142.9	2	23.7	+60.0	143.0	1	35.8	+60.0	143.0	0 00.0 +60.0 143.0	0
1	6	35.0	+59.8	142.7	5	47.2	+59.9	142.8	4	59.4	+59.9	142.8	4	11.6	+59.9	142.9	3	23.7	+60.0	142.9	2	35.8	+60.0	143.0	1 00.0 +60.0 143.0	1
2	7	34.8	+59.8	142.6	6	47.1	+59.9	142.7	5	59.3	+59.9	142.8	5	11.5	+60.0	142.8	4	23.7	+59.9	142.9	3	35.8	+60.0	142.9	2 00.0 +60.0 143.0	2
3	8	34.6	+59.8	142.6	7	47.0	+59.8	142.7	6	59.2	+59.9	142.7	6	11.5	+59.9	142.8	5	23.6	+60.0	142.9	4	35.8	+60.0	142.9	3 00.0 +60.0 143.0	3
4	9	34.5	+59.8	142.5	8	46.8	+59.9	142.6	7	59.1	+60.0	142.7	7	11.4	+59.9	142.8	6	23.6	+60.0	142.8	5	35.8	+60.0	142.9	4 00.0 +60.0 143.0	4
5	10	34.3	+59.8	142.4	9	46.7	+59.9	142.5	8	59.1	+59.9	142.6	8	11.3	+60.0	142.7	7	23.6	+60.0	142.8	6	35.8	+59.9	142.9	5 00.0 +60.0 143.0	5
6	11	34.1	+59.9	142.3	10	46.6	+59.9	142.5	9	59.0	+59.9	142.6	9	11.3	+59.9	142.7	8	23.6	+59.9	142.8	7	35.7	+60.0	142.9	6 00.0 +60.0 143.0	6
7	12	34.0	+59.8	142.3	11	46.5	+59.8	142.4	10	58.9	+59.9	142.5	10	11.2	+60.0	142.6	9	23.5	+60.0	142.7	8	35.7	+60.0	142.8	7 00.0 +60.0 143.0	7
8	13	33.8	+59.8	142.2	12	46.3	+59.9	142.3	11	58.8	+59.9	142.5	11	11.2	+59.9	142.6	10	23.5	+60.0	142.7	9	35.7	+60.0	142.8	8 00.0 +60.0 143.0	8
9	14	33.6	+59.8	142.1	13	46.2	+59.9	142.3	12	58.7	+59.9	142.4	12	11.1	+60.0	142.5	11	23.5	+59.9	142.7	10	35.7	+60.0	142.8	9 00.0 +60.0 143.0	9
10	15	33.4	+59.8	142.0	14	46.1	+59.9	142.2	13	58.6	+59.9	142.4	13	11.1	+59.9	142.5	12	23.4	+60.0	142.6	11	35.7	+60.0	142.8	10 00.0 +60.0 143.0	10
11	16	33.3	+59.8	142.0	15	46.0	+59.8	142.1	14	58.5	+60.0	142.3	14	11.0	+60.0	142.5	13	23.4	+60.0	142.6	12	35.7	+60.0	142.9	11 00.0 +60.0 143.0	11
12	17	33.1	+59.8	141.9	16	45.8	+59.9	142.1	15	58.5	+59.9	142.2	15	11.0	+59.9	142.4	14	23.4	+59.9	142.6	13	35.7	+60.0	142.7	12 00.0 +60.0 143.0	12
13	18	32.9	+59.8	141.8	17	45.7	+59.9	142.0	16	58.4	+59.9	142.2	16	10.9	+59.9	142.4	15	23.3	+60.0	142.5	14	35.7	+59.9	142.7	13 00.0 +60.0 143.0	13
14	19	32.7	+59.9	141.7	18	45.6	+59.8	141.9	17	58.3	+59.9	142.1	17	10.8	+60.0	142.3	16	23.3	+60.0	142.5	15	35.6	+60.0	142.7	14 00.0 +60.0 143.0	14
15	20	32.6	+59.8	141.6	19	45.4	+59.9	141.9	18	58.2	+59.9	142.1	18	10.8	+59.9	142.3	17	23.3	+59.9	142.5	16	35.6	+60.0	142.7	15 00.0 +60.0 143.0	15
16	21	32.4	+59.8	141.5	20	45.3	+59.9	141.8	19	58.1	+59.9	142.0	19	10.7	+60.0	142.2	18	23.2	+60.0	142.4	17	35.6	+60.0	142.6	16 00.0 +60.0 143.0	16
17	22	32.2	+59.8	141.5	21	45.2	+59.8	141.7	20	58.0	+59.9	142.0	20	10.7	+59.9	142.2	19	23.2	+60.0	142.4	18	35.6	+60.0	142.6	17 00.0 +60.0 143.0	17
18	23	32.0	+59.8	141.4	22	45.0	+59.9	141.6	21	57.9	+59.9	141.9	21	10.6	+59.9	142.1	20	23.2	+59.9	142.4	19	35.6	+60.0	142.6	18 00.0 +60.0 143.0	18
19	24	31.8	+59.8	141.3	23	44.9	+59.8	141.6	22	57.8	+59.9	141.8	22	10.5	+60.0	142.1	21	23.1	+60.0	142.3	20	35.6	+60.0	142.6	19 00.0 +60.0 143.0	19
20	25	31.6	+59.8	141.2	24	44.7	+59.9	141.5	23	57.7	+59.9	141.8	23	10.5	+59.9	142.0	22	23.1	+60.0	142.3	21	35.6	+59.9	142.5	20 00.0 +60.0 143.0	20
21	26	31.4	+59.8	141.1	25	44.6	+59.9	141.4	24	57.6	+59.9	141.7	24	10.4	+60.0	142.0	23	23.1	+59.9	142.3	22	35.5	+60.0	142.5	21 00.0 +60.0 143.0	21
22	27	31.2	+59.8	141.0	26	44.5	+59.8	141.3	25	57.5	+59.9	141.6	25	10.4	+59.9	141.9	24	23.0	+60.0	142.2	23	35.5	+60.0	142.4	22 00.0 +60.0 143.0	22
23	28	31.0	+59.8	140.9	27	44.3	+59.8	141.3	26	57.4	+59.9	141.6	26	10.3	+59.9	141.9	25	23.0	+60.0	142.2	24	35.5	+60.0	142.5	23 00.0 +60.0 143.0	23
24	29	30.8	+59.8	140.8	28	44.1	+59.9	141.2	27	57.3	+59.9	141.5	27	10.2	+60.0	141.8	26	23.0	+60.0	142.1	25	35.5	+60.0	142.4	24 00.0 +60.0 143.0	24
25	30	30.6	+59.7	140.7	29	44.0	+59.8	141.1	28	57.2	+59.9	141.4	28	10.2	+59.9	141.8	27	22.9	+60.0	142.1	26	35.5	+60.0	142.4	25 00.0 +60.0 143.0	25
26	31	30.3	+59.8	140.6	30	43.8	+59.9	141.0	29	57.1	+59.9	141.4	29	10.1	+59.9	141.7	28	22.9	+59.9	142.1	27	35.5	+59.9	142.4	26 00.0 +60.0 143.0	26
27	32	30.1	+59.8	140.5	31	43.7	+59.8	140.9	30	57.0	+59.9	141.3	30	10.0	+60.0	141.7	29	22.8	+60.0	142.0	28	35.4	+60.0	142.3	27 00.0 +60.0 143.0	27
28	33	29.9	+59.7	140.4	32	43.5	+59.8	140.8	31	56.9	+59.8	141.2	31	10.0	+59.9	141.6	30	22.8	+60.0	142.0	29	35.4	+60.0	142.3	28 00.0 +60.0 143.0	28
29	34	29.6	+59.8	140.3	33	43.3	+59.9	140.7	32	56.7	+59.9	141.1	32	0.9	+59.9	141.6	31	22.8	+59.9	141.9	30	35.4	+60.0	142.3	29 00.0 +60.0 143.0	29
30	35	29.4	+59.8	140.2	34	43.2	+59.8	140.6	33	56.6	+59.9	141.1	33	0.8	+59.9	141.5	32	22.7	+60.0	141.9	31	35.4	+60.0	142.3	30 00.0 +60.0 143.0	30
31	36	29.2	+59.7	140.1	35	43.0	+59.8	140.6	34	56.5	+59.9	141.0	34	0.7	+59.9	141.4	33	22.7	+59.9	142.1	32	35.4	+59.9	142.4	31 00.0 +60.0 143.0	31
32	37	28.9	+59.7	140.0	36	42.8	+59.8	140.5	35	56.4	+59.8	140.9	35	0.6	+60.0	141.4	34	22.6	+60.0	141.8	33	35.3	+60.0	142.2	32 00.0 +60.0 143.0	32
33	38	28.6	+59.8	139.9	37	42.6	+59.8	140.4	36	56.2	+59.9	140.8	36	0.6	+59.9	141.3	35	22.5	+60.0	141.7	34	35.3	+60.0	142.6	33 00.0 +60.0 143.0	33
34	39	28.4	+59.7	139.7	38	42.4	+59.8	140.3	37	56.1	+59.9	140.4	37	0.5	+59.9	141.2	36	22.5	+60.0	142.1	35	35.3	+60.0	142.4	34 00.0 +60.0 143.0	34
35	40	28.1	+59.7	139.6	39	42.2	+59.8	140.2	38	56.0	+59.8	140.7	38	0.4	+59.9	141.2	37	22.5	+60.0	141.7	36	35.3	+60.0	142.1	35 00.0 +60.0 143.0	35
36	41	27.8	+59.7	139.5	40	42.0	+59.8	140.0	39	55.8	+59.9	140.6	39	0.3	+59.9	141.1	38	22.5	+59.9	141.6	37	35.3	+60.0	142.1	36 00.0 +60.0 143.0	36
37	42	27.5	+59.7	139.3	41	41.8	+59.8	139.9	40	55.7	+59.9	140.5	40	0.2	+59.9	141.0	39	22.4	+60.0	142.0	38	35.2	+60.0	142.4	37 00.0 +60.0 143.0	37
38	43	27.2	+59.7	139.2	42	41.6	+59.8	139.8	41	55.6	+59.8	140.4	41	0.1	+59.9	141.0	40	22.4	+59.9	141.5	39	35.2	+60.0	142.5	38 00.0 +60.0 143.0	38
39	44	26.9																								

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 37°, 323°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	5	35.1	-59.8	142.8	4	47.3	-59.9	142.8	3	59.5	-59.9	142.9	3	11.6	-59.9	142.9	2	23.7	-59.9	143.0	1	35.8	-60.0	143.0	0	47.9	-60.0	143.0	0	0.00	+60.0	37.0	0
1	4	35.3	-59.9	142.9	3	47.4	-59.8	142.9	2	59.6	-60.0	142.9	2	11.7	-60.0	143.0	1	23.8	-60.0	143.0	0	35.8	-59.9	143.0	0	12.1	+60.0	37.0	1				
2	3	35.4	-59.8	142.9	2	47.6	-59.9	143.0	1	59.6	-59.9	143.0	1	11.7	-59.9	143.0	0	23.8	-60.0	143.0	0	24.1	+60.0	37.0	2								
3	2	35.6	-59.8	143.0	1	47.7	-59.9	143.0	0	59.7	-59.9	143.1	0	11.8	-60.0	143.1	0	36.2	+60.0	36.9	1	24.1	+60.0	37.0	3								
4	1	35.8	-59.9	143.1	0	47.8	-59.9	143.1	0	0.02	+59.9	36.9	0	48.2	+59.9	36.9	1	36.2	+59.9	36.9	2	24.1	+60.0	36.9	4								
5	0	35.9	-59.8	143.2	0	12.1	+59.9	36.8	1	0.01	+59.9	36.8	1	48.1	+60.0	36.9	2	36.1	+60.0	36.9	3	24.1	+60.0	36.9	4	0.00	+60.0	37.0	5				
6	0	23.9	+59.8	36.8	1	12.0	+59.8	36.8	2	0.00	+59.9	36.8	2	48.1	+59.9	36.8	3	36.1	+60.0	36.8	4	24.1	+60.0	36.9	5	12.1	+60.0	36.9	6	0.00	+60.0	37.0	6
7	1	23.7	+59.9	36.7	2	11.8	+59.9	36.7	2	59.9	+60.0	36.7	3	48.0	+60.0	36.8	4	36.1	+59.9	36.8	5	24.1	+60.0	36.9	6	12.1	+60.0	36.9	7	0.00	+60.0	37.0	7
8	2	23.6	+59.8	36.6	3	11.7	+59.9	36.6	3	59.9	+59.9	36.7	4	48.0	+59.9	36.7	5	36.0	+60.0	36.8	6	24.1	+60.0	36.8	7	12.1	+60.0	36.9	8	0.00	+60.0	37.0	8
9	3	23.4	+59.9	36.5	4	11.6	+59.9	36.6	4	59.8	+59.9	36.6	5	47.9	+60.0	36.7	6	36.0	+60.0	36.8	7	24.1	+59.9	36.8	8	12.1	+59.9	36.9	9	0.00	+60.0	37.0	9
10	4	23.3	+59.8	36.5	5	11.5	+59.9	36.5	5	59.7	+59.9	36.6	6	47.9	+59.9	36.6	7	36.0	+59.9	36.7	8	24.0	+60.0	36.8	9	12.0	+60.0	36.9	10	0.00	+60.0	37.0	10
11	5	23.1	+59.8	36.4	6	11.4	+59.9	36.5	6	59.6	+59.9	36.5	7	47.8	+59.9	36.6	8	35.9	+60.0	36.7	9	24.0	+60.0	36.8	10	12.0	+60.0	36.9	11	0.00	+60.0	37.0	11
12	6	22.9	+59.9	36.3	7	11.3	+59.8	36.4	7	59.5	+59.9	36.5	8	47.7	+60.0	36.6	9	35.9	+60.0	36.7	10	24.0	+60.0	36.8	11	12.0	+60.0	36.9	12	0.00	+60.0	37.0	12
13	7	22.8	+59.8	36.2	8	11.1	+59.9	36.3	8	59.4	+60.0	36.4	9	47.7	+59.9	36.5	10	35.9	+59.9	36.6	11	24.0	+60.0	36.7	12	12.0	+60.0	36.9	13	0.00	+60.0	37.0	13
14	8	22.6	+59.8	36.2	9	11.0	+59.9	36.3	9	59.4	+59.9	36.4	10	47.6	+60.0	36.5	11	35.8	+60.0	36.6	12	24.0	+60.0	36.7	13	12.0	+60.0	36.9	14	0.00	+60.0	37.0	14
15	9	22.4	+59.9	36.1	10	10.9	+59.9	36.2	10	59.3	+59.9	36.3	11	47.6	+59.9	36.4	12	35.8	+60.0	36.6	13	24.0	+60.0	36.7	14	12.0	+60.0	36.8	15	0.00	+60.0	37.0	15
16	10	22.3	+59.8	36.0	11	10.8	+59.8	36.1	11	59.2	+59.9	36.3	12	47.5	+60.0	36.4	13	35.8	+60.0	36.5	14	24.0	+59.9	36.7	15	12.0	+60.0	36.8	16	0.00	+60.0	37.0	16
17	11	22.1	+59.8	35.9	12	10.6	+59.9	36.1	12	59.1	+59.9	36.2	13	47.5	+59.9	36.3	14	35.8	+59.9	36.5	15	23.9	+60.0	36.7	16	12.0	+60.0	36.8	17	0.00	+60.0	37.0	17
18	12	21.9	+59.9	35.9	13	10.5	+59.9	36.0	13	59.0	+59.9	36.1	14	47.4	+60.0	36.3	15	35.7	+60.0	36.5	16	23.9	+60.0	36.6	17	12.0	+60.0	36.8	18	0.00	+60.0	37.0	18
19	13	21.8	+59.8	35.8	14	10.4	+59.9	35.9	14	58.9	+59.9	36.1	15	47.4	+59.9	36.3	16	35.7	+60.0	36.4	17	23.9	+60.0	36.6	18	12.0	+60.0	36.8	19	0.00	+60.0	37.0	19
20	14	21.6	+59.8	35.7	15	10.3	+59.8	35.9	15	58.8	+59.9	36.0	16	47.3	+59.9	36.2	17	35.7	+59.9	36.4	18	23.9	+60.0	36.6	19	12.0	+60.0	36.8	20	0.00	+60.0	37.0	20
21	15	21.4	+59.8	35.6	16	10.1	+59.9	35.8	16	58.7	+60.0	36.0	17	47.2	+60.0	36.2	18	35.6	+60.0	36.4	19	23.9	+60.0	36.6	20	12.0	+60.0	36.8	21	0.00	+60.0	37.0	21
22	16	21.2	+59.9	35.6	17	10.0	+59.9	35.7	17	58.7	+59.9	35.9	18	47.2	+59.9	36.1	19	35.6	+60.0	36.3	20	23.9	+60.0	36.5	21	12.0	+60.0	36.8	22	0.00	+60.0	37.0	22
23	17	21.1	+59.8	35.5	18	9.9	+59.8	35.7	18	58.6	+59.9	35.9	19	47.1	+60.0	36.1	20	35.6	+59.9	36.3	21	23.9	+59.9	36.5	22	12.0	+60.0	36.8	23	0.00	+60.0	37.0	23
24	18	20.9	+59.8	35.4	19	9.7	+59.9	35.6	19	58.5	+59.9	35.8	20	47.1	+59.9	36.0	21	35.5	+60.0	36.2	22	23.8	+60.0	36.5	23	12.0	+60.0	36.7	24	0.00	+60.0	37.0	24
25	19	20.7	+59.8	35.3	20	9.6	+59.9	35.5	20	58.4	+59.9	35.7	21	47.0	+59.9	36.0	22	35.5	+60.0	36.2	23	23.8	+60.0	36.5	24	12.0	+60.0	36.8	25	0.00	+60.0	37.0	25
26	20	20.5	+59.8	35.2	21	9.5	+59.8	35.5	21	58.3	+59.9	35.7	22	46.9	+60.0	35.9	23	35.5	+59.9	36.2	24	23.8	+60.0	36.4	25	12.0	+60.0	36.7	26	0.00	+60.0	37.0	26
27	21	20.3	+59.9	35.1	22	9.3	+59.9	35.4	22	58.2	+59.9	35.6	23	46.9	+59.9	35.9	24	35.4	+60.0	36.1	25	23.8	+60.0	36.4	26	12.0	+60.0	36.7	27	0.00	+60.0	37.0	27
28	22	20.2	+59.8	35.1	23	9.2	+59.9	35.3	23	58.1	+59.9	35.6	24	46.8	+59.9	35.8	25	35.4	+59.9	36.1	26	23.8	+60.0	36.3	27	12.0	+60.0	36.7	28	0.00	+60.0	37.0	28
29	23	20.0	+59.8	35.0	24	9.1	+59.8	34.8	24	57.5	+59.8	35.2	25	46.7	+60.0	35.8	26	35.3	+60.0	35.9	27	23.8	+59.9	36.2	28	12.0	+60.0	36.6	29	0.00	+60.0	37.0	29
30	24	19.8	+59.8	34.9	25	8.9	+59.9	34.8	25	57.9	+59.9	35.1	26	46.7	+59.9	35.7	27	35.3	+60.0	36.0	28	23.7	+60.0	36.3	29	12.0	+60.0	36.7	30	0.00	+60.0	37.0	30
31	25	19.6	+59.8	34.8	26	8.8	+59.8	35.1	26	57.8	+59.9	35.4	27	46.6	+59.9	35.7	28	35.3	+59.9	36.0	29	23.7	+60.0	36.3	30	12.0	+60.0	36.6	31	0.00	+60.0	37.0	31
32	26	19.4	+59.8	34.7	27	8.6	+59.9	35.0	27	57.7	+59.9	35.3	28	46.5	+60.0	35.6	29	35.2	+60.0	35.9	30	23.7	+60.0	36.3	31	12.0	+60.0	36.6	32	0.00	+60.0	37.0	32
33	27	19.2	+59.8	34.6	28	8.5	+59.8	34.9	28	57.6	+59.9	35.2	29	46.5	+59.9	35.6	30	35.2	+59.9	35.9	31	23.7	+60.0	36.2	32	12.0	+60.0	36.6	33	0.00	+60.0	37.0	33
34	28	19.0	+59.8	34.5	29	8.3	+59.8	34.8	29	57.5	+59.9	35.5																					

38°, 322° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Dec.																					
0	5 30.7	+59.8	141.8	4 43.5	+59.9	141.8	3 56.3	+59.9	141.9	3 09.1	+59.9	141.9	2 21.8	+60.0	142.0	1 34.6	+59.9	142.0	0 47.3	+60.0	142.0	0 00.0	+60.0	142.0	0
1	6 30.5	+59.8	141.7	5 43.4	+59.8	141.8	4 56.2	+59.9	141.8	4 09.0	+60.0	141.9	3 21.8	+60.0	141.9	2 34.5	+60.0	142.0	1 47.3	+60.0	142.0	1 00.0	+60.0	142.0	1
2	7 30.3	+59.8	141.6	6 43.2	+59.9	141.7	5 56.1	+59.9	141.8	5 09.0	+59.9	141.8	4 21.8	+59.9	141.9	3 34.5	+60.0	142.0	2 47.3	+60.0	142.0	2 00.0	+60.0	142.0	2
3	8 30.1	+59.8	141.6	7 43.1	+59.9	141.7	6 56.0	+59.9	141.7	6 08.9	+59.9	141.8	5 21.7	+60.0	141.9	4 34.5	+60.0	142.0	3 47.3	+60.0	142.0	3 00.0	+60.0	142.0	3
4	9 30.0	+59.8	141.5	8 43.0	+59.9	141.6	7 55.9	+60.0	141.7	7 08.8	+60.0	141.8	6 21.7	+60.0	141.8	5 34.5	+60.0	141.9	4 47.3	+60.0	142.0	4 00.0	+60.0	142.0	4
5	10 29.8	+59.8	141.4	9 42.9	+59.8	141.5	8 55.9	+59.9	141.6	8 08.8	+59.9	141.7	7 21.7	+59.9	141.8	6 34.5	+60.0	141.9	5 47.3	+60.0	141.9	5 00.0	+60.0	142.0	5
6	11 29.6	+59.8	141.3	10 42.7	+59.8	141.5	9 55.8	+59.9	141.6	9 08.7	+60.0	141.7	8 21.6	+60.0	141.8	7 34.5	+60.0	141.9	6 47.3	+60.0	141.9	6 00.0	+60.0	142.0	6
7	12 29.4	+59.8	141.3	11 42.6	+59.9	141.4	10 55.7	+59.9	141.5	10 08.7	+59.9	141.6	9 21.6	+60.0	141.7	8 34.5	+59.9	141.8	7 47.3	+60.0	141.9	7 00.0	+60.0	142.0	7
8	13 29.3	+59.8	141.2	12 42.5	+59.8	141.3	11 55.6	+59.9	141.5	11 08.6	+60.0	141.6	10 21.6	+59.9	141.7	9 34.4	+60.0	141.8	8 47.3	+59.9	141.9	8 00.0	+60.0	142.0	8
9	14 29.1	+59.8	141.1	13 42.3	+59.9	141.3	12 55.5	+59.9	141.4	12 08.6	+59.9	141.5	11 21.5	+60.0	141.7	10 34.4	+60.0	141.8	9 47.2	+60.0	141.9	9 00.0	+60.0	142.0	9
10	15 28.9	+59.8	141.0	14 42.2	+59.9	141.2	13 55.4	+59.9	141.3	13 08.5	+59.9	141.5	12 21.5	+60.0	141.6	11 34.4	+60.0	141.8	10 47.2	+60.0	141.9	10 00.0	+60.0	142.0	10
11	16 28.7	+59.8	140.9	15 42.1	+59.8	141.1	14 55.3	+59.9	141.3	14 08.4	+60.0	141.4	13 21.5	+59.9	141.6	12 34.4	+60.0	141.7	11 47.2	+60.0	141.9	11 00.0	+60.0	142.0	11
12	17 28.5	+59.8	140.9	16 41.9	+59.9	141.0	15 55.2	+59.9	141.2	15 08.4	+59.9	141.4	14 21.4	+60.0	141.6	13 34.4	+60.0	141.7	12 47.2	+60.0	141.9	12 00.0	+60.0	142.0	12
13	18 28.3	+59.9	140.8	17 41.8	+59.9	141.0	16 55.1	+59.9	141.2	16 08.3	+60.0	141.4	15 21.4	+60.0	141.5	14 34.4	+60.0	141.7	13 47.2	+60.0	141.9	13 00.0	+60.0	142.0	13
14	19 28.2	+59.8	140.7	18 41.7	+59.8	140.9	17 55.0	+59.9	141.1	17 08.3	+59.9	141.3	16 21.4	+59.9	141.5	15 34.4	+59.9	141.7	14 47.2	+60.0	141.8	14 00.0	+60.0	142.0	14
15	20 28.0	+59.8	140.6	19 41.5	+59.9	140.8	18 54.9	+59.9	141.1	18 08.2	+59.9	141.3	17 21.3	+60.0	141.5	16 34.3	+60.0	141.7	15 47.2	+60.0	141.8	15 00.0	+60.0	142.0	15
16	21 27.8	+59.8	140.5	20 41.4	+59.8	140.8	19 54.8	+59.9	141.0	19 08.1	+60.0	141.2	18 21.3	+60.0	141.4	17 34.3	+60.0	141.6	16 47.2	+60.0	141.8	16 00.0	+60.0	142.0	16
17	22 27.6	+59.8	140.4	21 41.2	+59.9	140.7	20 54.7	+59.9	140.9	20 08.1	+59.9	141.2	19 21.3	+59.9	141.4	18 34.3	+60.0	141.6	17 47.2	+60.0	141.8	17 00.0	+60.0	142.0	17
18	23 27.4	+59.8	140.3	22 41.1	+59.8	140.6	21 54.6	+59.9	140.9	21 08.0	+59.9	141.1	20 21.2	+60.0	141.4	19 34.3	+60.0	141.6	18 47.2	+60.0	141.8	18 00.0	+60.0	142.0	18
19	24 27.2	+59.8	140.2	23 40.9	+59.9	140.5	22 54.5	+59.9	140.8	22 07.9	+60.0	141.1	21 21.2	+60.0	141.3	20 34.3	+60.0	141.6	19 47.2	+60.0	141.8	19 00.0	+60.0	142.0	19
20	25 27.0	+59.8	140.2	24 40.8	+59.8	140.5	23 54.4	+59.9	140.7	23 07.9	+59.9	141.0	22 21.2	+59.9	141.3	21 34.3	+59.9	141.5	20 47.2	+60.0	141.8	20 00.0	+60.0	142.0	20
21	26 26.8	+59.7	140.1	25 40.6	+59.9	140.4	24 54.3	+59.9	140.7	24 07.8	+59.9	141.0	23 21.1	+60.0	141.2	22 34.2	+60.0	141.5	21 47.2	+60.0	141.8	21 00.0	+60.0	142.0	21
22	27 26.5	+59.8	140.0	26 40.5	+59.8	140.3	25 54.2	+59.9	140.6	25 07.7	+60.0	140.9	24 21.1	+59.9	141.2	23 34.2	+60.0	141.5	22 47.2	+60.0	141.7	22 00.0	+60.0	142.0	22
23	28 26.3	+59.8	139.9	27 40.3	+59.9	140.2	26 54.1	+59.9	140.5	26 07.7	+59.9	140.9	25 21.0	+60.0	141.2	24 34.2	+60.0	141.5	23 47.2	+60.0	141.7	23 00.0	+60.0	142.0	23
24	29 26.1	+59.8	139.8	28 40.2	+59.8	140.1	27 54.0	+59.9	140.5	27 07.6	+59.9	140.8	26 21.0	+60.0	141.1	25 34.2	+60.0	141.4	24 47.2	+60.0	141.7	24 00.0	+60.0	142.0	24
25	30 25.9	+59.7	139.7	29 40.0	+59.8	140.0	28 53.9	+59.9	140.4	28 07.5	+60.0	140.8	27 21.0	+59.9	141.1	26 34.2	+60.0	141.4	25 47.2	+60.0	141.7	25 00.0	+60.0	142.0	25
26	31 25.6	+59.8	139.6	30 39.8	+59.9	140.0	29 53.8	+59.9	140.3	29 07.5	+59.9	140.7	28 20.9	+60.0	141.0	27 34.2	+59.9	141.4	26 47.2	+60.0	141.7	26 00.0	+60.0	142.0	26
27	32 25.4	+59.8	139.5	31 39.7	+59.8	139.9	30 53.7	+59.8	140.3	30 07.4	+59.9	140.6	29 20.9	+59.9	141.0	28 34.1	+60.0	141.3	27 47.2	+60.0	141.7	27 00.0	+60.0	142.0	27
28	33 25.2	+59.7	139.4	32 39.5	+59.8	139.8	31 53.5	+59.9	140.2	31 07.3	+59.9	140.6	30 20.8	+60.0	141.0	29 34.1	+60.0	141.3	28 47.2	+60.0	141.7	28 00.0	+60.0	142.0	28
29	34 24.9	+59.8	139.3	33 39.3	+59.8	139.7	32 53.4	+59.9	140.1	32 07.2	+60.0	140.5	31 20.8	+60.0	140.9	30 34.1	+60.0	141.3	29 47.2	+60.0	141.7	29 00.0	+60.0	142.0	29
30	35 24.7	+59.7	139.1	34 39.1	+59.9	139.6	33 53.3	+59.9	140.0	33 07.2	+59.9	140.5	32 20.8	+59.9	140.9	31 34.1	+60.0	141.3	30 47.2	+60.0	141.6	30 00.0	+60.0	142.0	30
31	36 24.4	+59.6	139.0	35 39.0	+59.8	139.5	34 53.2	+59.8	140.0	34 07.1	+59.9	140.4	33 20.7	+60.0	140.8	32 34.1	+59.9	141.2	31 47.2	+60.0	141.6	31 00.0	+60.0	142.0	31
32	37 24.2	+59.7	138.9	36 38.8	+59.8	139.4	35 53.0	+59.9	139.9	35 07.0	+59.9	140.3	34 20.7	+59.9	140.8	33 34.0	+60.0	141.2	32 47.2	+59.9	141.6	32 00.0	+60.0	142.0	32
33	38 23.9	+59.7	138.8	37 38.6	+59.8	139.3	36 52.9	+59.9	139.8	36 06.9	+59.9	140.3	35 20.6	+60.0	140.7	34 34.0	+60.0	141.2	33 47.1	+60.0	141.6	33 00.0	+60.0	142.0	33
34	39 23.6	+59.7	138.7	38 38.4	+59.7	138.7	37 54.7	+59.8	139.6	37 06.8	+59.8	140.1	36 20.5	+60.0	140.6	35 34.0	+60.0	141.1	35 47.1	+60.0	141.6	35 00.0	+60.0	142.0	34
35	40 23.3	+59.8	138.5	39 38.2	+59.7	139.1	38 52.6	+59.9	139.6	38 06.7	+60.0	140.1	37 20.5	+60.0	140.6	36 34.0	+59.9	141.1	36 47.1	+60.0	141.5	36 00.0	+60.0	142.0	35
36	41 23.0	+59.7	138.4	40 37.9	+59.8	139.0	39 52.5	+59.8	139.5	39 06.7	+59.9	140.1	38 20.5	+59.9	140.6	37 34.0	+59.9	141.1	36 47.1	+60.0	141				

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 38°, 322°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	5	30.7	-59.9	141.8	4	43.5	-59.9	141.8	3	56.3	-59.9	141.9	3	09.1	-60.0	141.9	2	21.8	-60.0	142.0	1	34.6	-60.0	142.0	0	47.3	-60.0	142.0	0	0.00	+60.0	38.0	0
1	4	30.8	-59.8	141.9	3	43.6	-59.9	141.9	2	56.4	-59.9	141.9	2	09.1	-59.9	142.0	1	21.8	-59.9	142.0	0	34.6	-60.0	142.0	0	12.7	+60.0	38.0	1				
2	3	31.0	-59.8	141.9	2	43.7	-59.8	142.0	1	56.5	-60.0	142.0	1	09.2	-60.0	142.0	0	21.9	-60.0	142.0	0	25.4	+60.0	38.0	2								
3	2	31.2	-59.9	142.0	1	43.9	-59.9	142.0	0	56.5	-59.9	142.1	0	09.2	-59.9	142.1	0	38.1	+60.0	37.9	1	25.4	+60.0	38.0	3								
4	1	31.3	-59.8	142.1	0	44.0	-59.9	142.1	0	03.4	+59.9	37.9	0	50.7	+60.0	37.9	1	38.1	+59.9	37.9	2	25.4	+60.0	38.0	4								
5	0	31.5	-59.8	142.2	0	15.9	+59.9	37.8	1	03.3	+59.9	37.8	1	50.7	+59.9	37.9	2	38.0	+60.0	37.9	3	25.4	+60.0	38.0	5								
6	0	28.3	+59.9	37.8	1	15.8	+59.8	37.8	2	03.2	+59.9	37.8	2	50.6	+59.9	37.8	3	38.0	+60.0	37.8	4	25.4	+59.9	37.9	6								
7	1	28.2	+59.8	37.7	2	15.6	+59.9	37.7	3	03.1	+59.9	37.7	3	50.5	+60.0	37.8	4	38.0	+59.9	37.8	5	25.3	+60.0	37.9	7								
8	2	28.0	+59.8	37.6	3	15.5	+59.9	37.6	4	03.0	+59.9	37.7	4	50.5	+59.9	37.7	5	37.9	+60.0	37.8	6	25.3	+60.0	37.9	8								
9	3	27.8	+59.9	37.5	4	15.4	+59.9	37.6	5	02.9	+59.9	37.6	5	50.4	+60.0	37.7	6	37.9	+60.0	37.7	7	25.3	+60.0	37.8	9								
10	4	27.7	+59.8	37.5	5	15.3	+59.8	37.5	6	02.8	+60.0	37.6	6	50.4	+59.9	37.6	7	37.9	+59.9	37.7	8	25.3	+60.0	37.8	10								
11	5	27.5	+59.8	37.4	6	15.1	+59.9	37.4	7	02.8	+59.9	37.5	7	50.3	+60.0	37.6	8	37.8	+60.0	37.7	9	25.3	+60.0	37.8	11								
12	6	27.3	+59.8	37.3	7	15.0	+59.9	37.4	8	02.7	+59.9	37.5	8	50.3	+59.9	37.5	9	37.8	+60.0	37.6	10	25.3	+60.0	37.8	12								
13	7	27.1	+59.9	37.2	8	14.9	+59.9	37.3	9	02.6	+59.9	37.4	9	50.2	+60.0	37.5	10	37.8	+59.9	37.6	11	25.3	+59.9	37.7	13								
14	8	27.0	+59.8	37.2	9	14.8	+59.8	37.2	10	02.5	+59.9	37.3	10	50.2	+59.9	37.5	11	37.7	+60.0	37.6	12	25.2	+60.0	37.7	14								
15	9	26.8	+59.8	37.1	10	14.6	+59.9	37.2	11	02.4	+59.9	37.3	11	50.1	+59.9	37.4	12	37.7	+60.0	37.5	13	25.2	+60.0	37.7	15								
16	10	26.6	+59.8	37.0	11	14.5	+59.9	37.1	12	02.3	+59.9	37.2	12	50.0	+60.0	37.4	13	37.7	+59.9	37.5	14	25.2	+60.0	37.7	16								
17	11	26.4	+59.9	36.9	12	14.4	+59.8	37.0	13	02.2	+59.9	37.2	13	50.0	+59.9	37.3	14	37.6	+60.0	37.5	15	25.2	+60.0	37.6	17								
18	12	26.3	+59.8	36.8	13	14.2	+59.9	37.0	14	02.1	+59.9	37.1	14	49.9	+60.0	37.3	15	37.6	+60.0	37.4	16	25.2	+60.0	37.6	18								
19	13	26.1	+59.8	36.8	14	14.1	+59.9	36.9	15	02.0	+59.9	37.1	15	49.9	+59.9	37.2	16	37.6	+59.9	37.4	17	25.2	+60.0	37.6	19								
20	14	25.9	+59.8	36.7	15	14.0	+59.8	36.8	16	01.9	+59.9	37.0	16	49.8	+59.9	37.2	17	37.5	+60.0	37.4	18	25.2	+59.9	37.6	20								
21	15	25.7	+59.8	36.6	16	13.8	+59.9	36.8	17	01.8	+60.0	37.0	17	49.7	+60.0	37.1	18	37.5	+60.0	37.3	19	25.1	+60.0	37.5	21								
22	16	25.5	+59.9	36.5	17	13.7	+59.8	36.7	18	01.8	+59.9	36.9	18	49.7	+59.9	37.1	19	37.5	+59.9	37.3	20	25.1	+60.0	37.5	22								
23	17	25.4	+59.8	36.4	18	13.6	+59.8	36.6	19	01.7	+59.9	36.8	19	49.6	+60.0	37.0	20	37.4	+60.0	37.3	21	25.1	+60.0	37.5	23								
24	18	25.2	+59.8	36.4	19	13.4	+59.9	36.6	20	01.6	+59.9	36.8	20	49.6	+59.9	37.0	21	37.4	+60.0	37.2	22	25.1	+60.0	37.5	24								
25	19	25.0	+59.8	36.3	20	13.3	+59.9	36.5	21	01.5	+59.9	36.7	21	49.5	+59.9	36.9	22	37.4	+59.9	37.2	23	25.1	+60.0	37.4	25								
26	20	24.8	+59.8	36.2	21	13.2	+59.8	36.4	22	01.4	+59.9	36.6	22	49.4	+60.0	36.9	23	37.3	+60.0	37.2	24	25.1	+59.9	37.4	26								
27	21	24.6	+59.8	36.1	22	13.0	+59.9	36.3	23	01.3	+59.9	36.6	23	49.4	+59.9	36.8	24	37.3	+60.0	37.1	25	25.0	+60.0	37.4	27								
28	22	24.4	+59.8	36.0	23	12.9	+59.8	36.3	24	01.2	+59.9	36.5	24	49.3	+59.9	36.8	25	37.3	+59.9	37.1	26	25.0	+60.0	37.4	28								
29	23	24.2	+59.8	35.9	24	12.7	+59.9	36.2	25	01.1	+59.8	36.5	25	49.2	+60.0	36.7	26	37.2	+60.0	37.0	27	25.0	+60.0	37.3	29								
30	24	24.0	+59.8	35.8	25	12.6	+59.8	36.1	26	00.9	+59.9	36.4	26	49.2	+59.9	36.7	27	37.2	+59.9	37.0	28	25.0	+60.0	37.3	30								
31	25	23.8	+59.8	35.7	26	12.4	+59.9	36.0	27	00.8	+59.9	36.3	27	49.1	+59.9	36.6	28	37.1	+60.0	37.0	29	25.0	+60.0	37.3	31								
32	26	23.6	+59.8	35.7	27	12.3	+59.8	35.9	28	00.7	+59.9	36.3	28	49.0	+59.9	36.6	29	37.1	+60.0	36.9	30	25.0	+59.9	37.3	32								
33	27	23.4	+59.8	35.6	28	12.1	+59.8	35.9	29	00.6	+59.9	36.2	29	48.9	+60.0	36.5	30	37.1	+59.9	36.9	31	24.9	+60.0	36.0	33								
34	28	23.2	+59.7	35.5	29	11.9	+59.9	35.8	30	00.5	+59.9	36.1	30	48.9	+59.9	36.5	31	37.0	+60.0	36.8	32	24.9	+60.0	36.0	34								
35	29	22.9	+59.8	35.4	30	11.8	+59.8	35.7	31	00.4	+59.9	36.0	31	48.8	+59.9	36.4	32	37.0	+59.9	36.8	33	24.9	+60.0	36.0	35								
36	30	22.7	+59.8	35.3	31	11.6	+59.8	35.6	32	00.3	+59.8	36.0	32	48.7	+59.9	36.3	33	36.9	+60.0	36.7	34	24.9	+60.0	36.0	36								
37	31	22.5	+59.7	35.2	32	11.4	+59.9	35.5	33	00.1	+59.9	35.9	33	48.6	+60.0	36.3	34	36.9	+59.9	36.7	35	24.9	+60.0	36.0	37								
38	32	22.2	+59.8	35.1	33	11.3	+59.8	35.4	34	00.0	+59.9	35.8	34	48.6	+59.9	36.2	35	36.8	+60.0	36.5	36	24.8	+60.0	36.0	38								
39	33	22.0	+59.8	35.0	34	11.1	+59.8	35.3	35	00.9	+59.9	35.7	35	48.5	+59.9	36.2	36	36.8	+59.9	36.6	37	24.8	+60.0	36.0	39								
40	34	21.8	+59.7	34.8	35	10.9	+59.8	35.2	35	00.8	+59.8	35.7	36	48.4	+59.9	36.1	37	36.7	+60.0	36.5	38	24.7	+60.0	36.0	40								
41	35	21.5	+59.8	34.7	36	10.7	+59.8	35.1	36	00.7	+59.8	35.6	37	48.3	+59.9	36.0	38	36.7	+59.9	36.5	39	24.6	+60.0	36.0	41								
42	36	21.3	+59.7	34.6	37	10.5	+59.8	35.0	37	00.6	+59.9	35.5	38	48.2	+59.9	36.0	39	36.6	+60.0	36.5	40	24.5	+60.0	36.0	42								

39°, 321° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	Dec.				
0	5	26.1	+59.8	140.8	4	39.6	+59.8	140.8	3	53.0	+59.9	140.9	3	06.5	+59.9	140.9	2	19.9	+59.9	141.0	1	33.3	+59.9	141.0	0	00.0	+60.0	141.0	0
1	6	25.9	+59.8	140.7	5	39.4	+59.9	140.8	4	52.9	+59.9	140.8	4	06.4	+59.9	140.9	3	19.8	+60.0	140.9	2	33.2	+60.0	141.0	1	46.6	+60.0	141.0	1
2	7	25.7	+59.8	140.6	6	39.3	+59.9	140.7	5	52.8	+60.0	140.8	5	06.3	+60.0	140.8	4	19.8	+60.0	140.9	3	33.2	+60.0	140.9	2	46.6	+60.0	141.0	2
3	8	25.5	+59.8	140.6	7	39.2	+59.8	140.6	6	52.8	+59.9	140.7	6	06.3	+59.9	140.8	5	19.8	+59.9	140.9	4	33.2	+60.0	140.9	3	46.6	+60.0	141.0	3
4	9	25.4	+59.8	140.5	8	39.0	+59.9	140.6	7	52.7	+59.9	140.7	7	06.2	+60.0	140.8	6	19.7	+60.0	140.8	5	33.2	+60.0	140.9	4	46.6	+60.0	141.0	4
5	10	25.2	+59.8	140.4	9	38.9	+59.9	140.5	8	52.6	+59.9	140.6	8	06.2	+59.9	140.7	7	19.7	+60.0	140.8	6	33.2	+60.0	140.9	5	46.6	+60.0	141.0	5
6	11	25.0	+59.8	140.3	10	38.8	+59.8	140.4	9	52.5	+59.9	140.6	9	06.1	+59.9	140.7	8	19.7	+59.9	140.8	7	33.2	+59.9	140.9	6	46.6	+60.0	141.0	6
7	12	24.8	+59.8	140.2	11	38.6	+59.9	140.4	10	52.4	+59.9	140.5	10	06.0	+60.0	140.6	9	19.6	+60.0	140.7	8	33.1	+60.0	140.8	7	46.6	+60.0	141.0	7
8	13	24.6	+59.8	140.2	12	38.5	+59.9	140.3	11	52.3	+59.9	140.4	11	06.0	+59.9	140.6	10	19.6	+60.0	140.7	9	33.1	+60.0	140.8	8	46.6	+60.0	141.0	8
9	14	24.4	+59.8	140.1	13	38.4	+59.8	140.2	12	52.2	+59.9	140.4	12	05.9	+60.0	140.5	11	19.6	+59.9	140.7	10	33.1	+60.0	140.8	9	46.6	+60.0	141.0	9
10	15	24.2	+59.8	140.0	14	38.2	+59.9	140.2	13	52.1	+59.9	140.3	13	05.9	+59.9	140.5	12	19.5	+60.0	140.6	11	33.1	+60.0	140.8	10	46.6	+60.0	141.0	10
11	16	24.1	+59.8	139.9	15	38.1	+59.8	140.1	14	52.0	+59.9	140.3	14	05.8	+59.9	140.4	13	19.5	+60.0	140.6	12	33.1	+60.0	140.9	11	46.6	+60.0	141.0	11
12	17	23.9	+59.8	139.8	16	37.9	+59.9	140.0	15	51.9	+59.9	140.2	15	05.7	+60.0	140.4	14	19.5	+59.9	140.6	13	33.1	+60.0	140.9	12	46.6	+60.0	141.0	12
13	18	23.7	+59.8	139.7	17	37.8	+59.9	140.0	16	51.8	+59.9	140.2	16	05.7	+59.9	140.3	15	19.4	+60.0	140.5	14	33.1	+60.0	140.8	13	46.6	+60.0	141.0	13
14	19	23.5	+59.8	139.7	18	37.7	+59.8	139.9	17	51.7	+59.9	140.1	17	05.6	+60.0	140.3	16	19.4	+60.0	140.5	15	33.0	+60.0	140.7	14	46.6	+60.0	141.0	14
15	20	23.3	+59.8	139.6	19	37.5	+59.9	139.8	18	51.6	+59.9	140.0	18	05.6	+59.9	140.2	17	19.4	+59.9	140.4	16	33.0	+60.0	140.6	15	46.6	+60.0	141.0	15
16	21	23.1	+59.8	139.5	20	37.4	+59.8	139.7	19	51.5	+59.9	140.0	19	05.5	+59.9	140.2	18	19.3	+60.0	140.4	17	33.0	+60.0	140.6	16	46.6	+60.0	141.0	16
17	22	22.9	+59.8	139.4	21	37.2	+59.9	139.7	20	51.4	+59.9	139.9	20	05.4	+60.0	140.1	19	19.3	+59.9	140.4	18	33.0	+60.0	140.6	17	46.6	+60.0	141.0	17
18	23	22.7	+59.7	139.3	22	37.1	+59.8	139.6	21	51.3	+59.9	139.8	21	05.4	+59.9	140.1	20	19.2	+60.0	140.3	19	33.0	+60.0	140.6	18	46.6	+60.0	141.0	18
19	24	22.4	+59.8	139.2	23	36.9	+59.9	139.5	22	51.2	+59.9	139.8	22	05.3	+59.9	140.0	21	19.2	+60.0	140.3	20	33.0	+59.9	140.5	19	46.6	+60.0	141.0	19
20	25	22.2	+59.8	139.1	24	36.8	+59.8	139.4	23	51.1	+59.9	139.7	23	05.2	+60.0	140.0	22	19.2	+59.9	140.3	21	32.9	+60.0	140.5	20	46.6	+59.9	140.8	20
21	26	22.0	+59.8	139.0	25	36.6	+59.8	139.3	24	51.0	+59.9	139.6	24	05.2	+59.9	139.9	23	19.1	+60.0	140.2	22	32.9	+60.0	140.5	21	45.6	+60.0	141.0	21
22	27	21.8	+59.8	138.9	26	36.4	+59.8	139.3	25	50.9	+59.9	139.6	25	05.1	+59.9	139.9	24	19.1	+60.0	140.2	23	32.9	+60.0	140.5	22	45.6	+60.0	141.0	22
23	28	21.6	+59.7	138.8	27	36.3	+59.8	139.2	26	50.8	+59.8	139.5	26	05.0	+59.9	139.8	25	19.1	+59.9	140.1	24	32.9	+60.0	140.4	23	46.5	+60.0	141.0	23
24	29	21.3	+59.8	138.7	28	36.1	+59.8	139.1	27	50.6	+59.9	139.4	27	04.9	+60.0	139.8	26	19.0	+60.0	140.1	25	32.9	+60.0	140.4	24	45.6	+60.0	141.0	24
25	30	21.1	+59.8	138.6	29	35.9	+59.9	139.0	28	50.5	+59.9	139.4	28	04.9	+59.9	139.7	27	19.0	+59.9	140.1	26	32.9	+59.9	140.4	25	46.5	+60.0	141.0	25
26	31	20.9	+59.7	138.5	30	35.8	+59.8	138.9	29	50.4	+59.9	139.3	29	04.8	+59.9	139.7	28	18.9	+60.0	140.0	27	32.8	+60.0	140.4	26	46.5	+60.0	141.0	26
27	32	20.6	+59.8	138.4	31	35.6	+59.8	138.8	30	50.3	+59.9	139.2	30	04.7	+59.9	139.6	29	18.9	+59.9	140.0	28	32.8	+60.0	140.3	27	46.5	+60.0	141.0	27
28	33	20.4	+59.7	138.3	32	35.4	+59.8	138.7	31	50.2	+59.8	139.2	31	04.6	+60.0	139.6	30	18.8	+60.0	139.9	29	32.8	+60.0	140.3	28	46.5	+60.0	141.0	28
29	34	20.1	+59.7	138.2	33	35.2	+59.8	138.6	32	50.0	+59.9	139.1	32	04.6	+59.9	139.5	31	18.8	+60.0	139.9	30	32.8	+60.0	140.3	29	46.5	+60.0	141.0	29
30	35	19.8	+59.8	138.1	34	35.0	+59.8	138.5	33	49.9	+59.9	139.0	33	04.5	+59.9	139.4	32	18.8	+59.9	139.8	31	32.8	+59.9	140.2	30	46.5	+60.0	141.0	30
31	36	19.6	+59.7	138.0	35	34.8	+59.8	138.5	34	49.8	+59.8	138.9	34	04.4	+59.9	139.3	33	18.7	+60.0	139.8	32	32.7	+60.0	140.2	31	46.5	+60.0	141.0	31
32	37	19.3	+59.7	137.8	36	34.6	+59.8	138.3	35	49.6	+59.9	138.8	35	04.3	+59.9	139.3	34	18.7	+59.9	139.7	33	32.7	+60.0	140.2	32	46.5	+60.0	141.0	32
33	38	19.0	+59.7	137.7	37	34.4	+59.8	138.2	36	49.5	+59.9	138.7	36	04.2	+59.9	139.2	35	18.6	+60.0	139.7	34	32.7	+60.0	140.2	33	46.5	+60.0	141.0	33
34	39	18.7	+59.7	137.6	38	34.2	+59.8	138.1	37	49.4	+59.8	138.7	37	04.1	+59.9	139.2	36	18.6	+59.9	139.7	35	32.7	+60.0	140.1	34	46.5	+60.0	141.0	34
35	40	18.4	+59.7	137.5	39	34.0	+59.8	138.0	38	49.2	+59.8	138.6	38	04.0	+59.9	139.1	37	18.5	+60.0	139.6	36	32.7	+59.9	140.1	35	46.5	+60.0	141.0	35
36	41	18.1	+59.7	137.3	40	33.8	+59.8	137.9	39	49.1	+59.8	138.5	39	03.9	+59.9	139.0	38	18.5	+59.9	139.5	37	32.6	+60.0	140.0	36	46.5	+60.0	141.0	36
37	42	17.8	+59.7	137.2	41	33.6	+59.7	137																					

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 39° , 321°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	5	26.1	-59.8	140.8	4	39.6	-59.9	140.8	3	53.0	-59.9	140.9	3	06.5	-60.0	140.9	2	19.9	-60.0	141.0	1	33.3	-60.0	141.0	0	46.6	-60.0	141.0	0	0.00	+60.0	39.0	0
1	4	26.3	-59.9	140.9	3	39.7	-59.9	140.9	2	53.1	-59.9	140.9	2	06.5	-59.9	141.0	1	19.9	-60.0	141.0	0	33.3	-60.0	141.0	0	13.4	+60.0	39.0	1				
2	3	26.4	-59.8	140.9	2	39.8	-59.8	141.0	1	53.2	-59.9	141.0	1	06.6	-60.0	141.0	0	19.9	-59.9	141.0	0	26.7	+60.0	39.0	2	0.00	+60.0	39.0	2				
3	2	26.6	-59.8	141.0	1	40.0	-59.9	141.0	0	53.3	-59.9	141.1	0	06.6	-59.9	141.1	0	40.0	+60.0	38.9	1	26.7	+60.0	39.0	3	0.00	+60.0	39.0	3				
4	1	26.8	-59.8	141.1	0	40.1	-59.9	141.1	0	06.6	+59.9	38.9	0	53.3	+60.0	38.9	1	40.0	+60.0	38.9	2	26.7	+60.0	38.9	3	13.4	+60.0	39.0	4				
5	0	27.0	-59.9	141.2	0	19.8	+59.8	38.8	1	06.5	+59.9	38.8	1	53.3	+59.9	38.8	2	40.0	+59.9	38.9	3	26.7	+60.0	38.9	4	13.4	+60.0	38.9	5	0.00	+60.0	39.0	5
6	0	32.9	+59.8	38.7	1	19.6	+59.9	38.8	2	06.4	+59.9	38.8	2	53.2	+59.9	38.8	3	39.9	+60.0	38.8	4	26.7	+59.9	38.9	5	13.4	+59.9	38.9	6	0.00	+60.0	39.0	6
7	1	32.7	+59.8	38.7	2	19.5	+59.9	38.7	3	06.3	+59.9	38.7	3	53.1	+60.0	38.8	4	39.9	+60.0	38.8	5	26.6	+60.0	38.9	6	13.3	+60.0	38.9	7	0.00	+60.0	39.0	7
8	2	32.5	+59.8	38.6	3	19.4	+59.9	38.6	4	06.2	+60.0	38.7	4	53.1	+59.9	38.7	5	39.9	+59.9	38.8	6	26.6	+60.0	38.8	7	13.3	+60.0	38.9	8	0.00	+60.0	39.0	8
9	3	32.3	+59.8	38.5	4	19.3	+59.8	38.6	5	06.2	+59.9	38.6	5	53.0	+60.0	38.7	6	39.8	+60.0	38.7	7	26.6	+60.0	38.8	8	13.3	+60.0	38.9	9	0.00	+60.0	39.0	9
10	4	32.1	+59.9	38.4	5	19.1	+59.9	38.5	6	06.1	+59.9	38.6	6	53.0	+59.9	38.6	7	39.8	+60.0	38.7	8	26.6	+60.0	38.8	9	13.3	+60.0	38.9	10	0.00	+60.0	39.0	10
11	5	32.0	+59.8	38.4	6	19.0	+59.9	38.4	7	06.0	+59.9	38.5	7	52.9	+59.9	38.6	8	39.8	+59.9	38.7	9	26.6	+60.0	38.8	10	13.3	+60.0	38.9	11	0.00	+60.0	39.0	11
12	6	31.8	+59.8	38.3	7	18.9	+59.8	38.4	8	05.9	+59.9	38.4	8	52.8	+60.0	38.5	9	39.7	+60.0	38.6	10	26.6	+60.0	38.8	11	13.3	+60.0	38.9	12	0.00	+60.0	39.0	12
13	7	31.6	+59.8	38.2	8	18.7	+59.9	38.3	9	05.8	+59.9	38.4	9	52.8	+59.9	38.5	10	39.7	+60.0	38.6	11	26.6	+59.9	38.7	12	13.3	+60.0	38.9	13	0.00	+60.0	39.0	13
14	8	31.4	+59.9	38.1	9	18.6	+59.9	38.2	10	05.7	+59.9	38.3	10	52.7	+60.0	38.4	11	39.7	+59.9	38.6	12	26.5	+60.0	38.7	13	13.3	+60.0	38.8	14	0.00	+60.0	39.0	14
15	9	31.3	+59.8	38.1	10	18.5	+59.8	38.2	11	05.6	+59.9	38.3	11	52.7	+59.9	38.4	12	39.6	+60.0	38.5	13	26.5	+60.0	38.7	14	13.3	+60.0	38.8	15	0.00	+60.0	39.0	15
16	10	31.1	+59.8	38.0	11	18.3	+59.9	38.1	12	05.5	+59.9	38.2	12	52.6	+59.9	38.4	13	39.6	+60.0	38.5	14	26.5	+60.0	38.7	15	13.3	+60.0	38.8	16	0.00	+60.0	39.0	16
17	11	30.9	+59.8	37.9	12	18.2	+59.9	38.0	13	05.4	+59.9	38.2	13	52.5	+60.0	38.3	14	39.6	+59.9	38.5	15	26.5	+60.0	38.6	16	13.3	+60.0	38.8	17	0.00	+60.0	39.0	17
18	12	30.7	+59.8	37.8	13	18.1	+59.8	38.0	14	05.3	+59.9	38.1	14	52.5	+60.0	38.3	15	39.5	+60.0	38.4	16	26.5	+60.0	38.6	17	13.3	+60.0	38.8	18	0.00	+60.0	39.0	18
19	13	30.5	+59.8	37.7	14	17.9	+59.9	37.9	15	05.2	+59.9	38.0	15	52.4	+60.0	38.2	16	39.5	+60.0	38.4	17	26.5	+60.0	38.6	18	13.3	+60.0	38.9	19	0.00	+60.0	39.0	19
20	14	30.3	+59.8	37.7	15	17.8	+59.8	37.8	16	05.1	+59.9	38.0	16	52.4	+59.9	38.2	17	39.5	+59.9	38.4	18	26.5	+59.9	38.6	19	13.3	+60.0	38.8	20	0.00	+60.0	39.0	20
21	15	30.1	+59.8	37.6	16	17.6	+59.9	37.7	17	05.0	+59.9	37.9	17	52.3	+59.9	38.1	18	39.4	+60.0	38.3	19	26.4	+60.0	38.5	20	13.3	+60.0	38.8	21	0.00	+60.0	39.0	21
22	16	29.9	+59.9	37.5	17	17.5	+59.8	37.7	18	04.9	+59.9	37.9	18	52.2	+60.0	38.1	19	39.4	+60.0	38.3	20	26.4	+60.0	38.5	21	13.3	+60.0	38.8	22	0.00	+60.0	39.0	22
23	17	29.8	+59.8	37.4	18	17.4	+59.8	37.6	19	04.8	+59.9	37.8	19	52.2	+59.9	38.0	20	39.4	+59.9	38.2	21	26.4	+60.0	38.5	22	13.3	+60.0	39.0	23				
24	18	29.6	+59.8	37.3	19	17.2	+59.9	37.5	20	04.7	+59.9	37.7	20	52.1	+59.9	38.0	21	39.3	+60.0	38.2	22	26.4	+60.0	38.5	23	13.3	+60.0	39.0	24				
25	19	29.4	+59.8	37.2	20	17.1	+59.8	37.4	21	04.6	+59.9	37.7	21	52.0	+60.0	37.9	22	39.3	+59.9	38.2	23	26.4	+60.0	38.4	24	13.3	+60.0	38.7	25	0.00	+60.0	39.0	25
26	20	29.2	+59.8	37.1	21	16.9	+59.9	37.4	22	04.5	+59.9	37.6	22	52.0	+59.9	37.9	23	39.2	+60.0	38.1	24	26.4	+59.9	38.4	25	13.3	+60.0	38.6	26	0.00	+60.0	39.0	26
27	21	29.0	+59.8	37.1	22	16.8	+59.8	37.3	23	04.4	+59.9	37.6	23	51.9	+59.9	37.8	24	39.2	+60.0	38.1	25	26.3	+60.0	38.4	26	13.3	+60.0	38.7	27	0.00	+60.0	39.0	27
28	22	28.8	+59.7	37.0	23	16.6	+59.8	37.2	24	04.3	+59.9	37.5	24	51.8	+60.0	37.8	25	39.2	+59.9	38.1	26	26.3	+60.0	38.4	27	13.3	+60.0	38.7	28	0.00	+60.0	39.0	28
29	23	28.5	+59.8	36.9	24	16.5	+59.8	36.7	25	04.2	+59.9	37.1	25	51.8	+60.0	37.7	26	39.1	+60.0	38.0	27	26.3	+60.0	38.3	28	13.3	+60.0	38.6	29	0.00	+60.0	39.0	29
30	24	28.3	+59.8	36.8	25	16.3	+59.8	37.1	26	04.1	+59.9	37.4	26	51.7	+59.9	37.7	27	39.1	+59.9	38.0	28	26.3	+60.0	38.3	29	13.3	+59.9	38.6	30	0.00	+60.0	39.0	30
31	25	28.1	+59.8	36.7	26	16.1	+59.9	37.0	27	04.0	+59.9	37.3	27	51.6	+59.9	37.6	28	39.0	+60.0	37.9	29	26.3	+59.9	38.6	30	13.2	+60.0	38.6	31	0.00	+60.0	39.0	31
32	26	27.9	+59.8	36.6	27	16.0	+59.8	36.9	28	03.9	+59.8	37.2	28	51.5	+60.0	37.5	29	39.0	+60.0	37.9	30	26.2	+60.0	38.2	31	13.2	+60.0	38.6	32	0.00	+60.0	39.0	32
33	27	27.7	+59.7	36.5	28	15.8	+59.8	36.8	29	03.7	+59.9	37.1	29	51.5	+59.9	37.5	30	39.0	+59.9	37.8	31	26.2	+60.0	38.6	32	13.2	+60.0	39.0	33	0.00	+60.0	39.0	33
34	28	27.4	+59.																														

40°, 320° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.		
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.		
0	5 21.4 +59.8 139.8	4 35.6 +59.8 139.8	3 49.7 +59.9 139.9	3 03.8 +59.9 139.9	2 17.9 +59.9 140.0	1 31.9 +60.0 140.0	0 46.0 +60.0 140.0	0 00.0 +60.0 140.0	0	10 20.5 +59.8 139.4	9 34.9 +59.8 139.5	8 49.2 +59.9 139.6	8 03.5 +59.9 139.7	7 17.7 +60.0 139.8	6 31.8 +60.0 139.9	5 45.9 +60.0 139.9	5 00.0 +60.0 140.0	5	11 20.3 +59.8 139.3	10 34.7 +59.9 139.4	9 49.1 +59.9 139.6	9 03.4 +60.0 139.7	8 31.7 +59.9 139.8	7 31.8 +60.0 139.8	6 45.9 +60.0 139.9	6 00.0 +60.0 140.0	6
1	6 21.2 +59.8 139.7	5 35.4 +59.9 139.8	4 49.6 +59.9 139.8	4 03.7 +60.0 139.9	3 17.8 +60.0 139.9	2 31.9 +60.0 140.0	1 46.0 +60.0 140.0	1 00.0 +60.0 140.0	1	7 21.0 +59.8 139.6	6 35.3 +59.9 139.7	5 49.5 +59.9 139.8	5 03.7 +59.9 139.8	4 17.8 +60.0 139.9	3 31.9 +60.0 139.9	2 46.0 +60.0 140.0	2 00.0 +60.0 140.0	2	8 20.8 +59.8 139.6	7 35.2 +59.8 139.6	6 49.4 +59.9 139.7	6 03.6 +59.9 139.8	5 17.8 +59.9 139.9	4 31.9 +60.0 139.9	3 46.0 +59.9 140.0	3 00.0 +60.0 140.0	3
2	9 20.7 +59.8 139.5	8 35.0 +59.9 139.6	7 49.3 +59.9 139.7	7 03.5 +60.0 139.8	6 17.7 +60.0 139.8	5 31.9 +59.9 139.9	4 45.9 +60.0 140.0	4 00.0 +60.0 140.0	4	10 20.5 +59.8 139.4	9 34.9 +59.8 139.5	8 49.2 +59.9 139.6	8 03.5 +59.9 139.7	7 17.7 +60.0 139.8	6 31.8 +60.0 139.9	5 45.9 +60.0 139.9	5 00.0 +60.0 140.0	5									
3	11 20.3 +59.8 139.3	10 34.7 +59.9 139.4	9 49.1 +59.9 139.6	9 03.4 +60.0 139.7	8 31.7 +59.9 139.8	7 31.8 +60.0 139.8	6 45.9 +60.0 139.9	6 00.0 +60.0 140.0	6	12 20.1 +59.8 139.2	11 34.6 +59.9 139.4	10 49.0 +59.9 139.5	10 03.4 +59.9 139.6	9 17.6 +60.0 139.7	8 31.8 +60.0 139.8	7 45.9 +60.0 139.9	7 00.0 +60.0 140.0	7									
4	13 19.9 +59.8 139.1	12 34.5 +59.8 139.3	11 48.9 +59.9 139.4	11 03.3 +59.9 139.6	10 17.6 +60.0 139.7	9 31.8 +60.0 139.8	8 45.9 +60.0 139.9	8 00.0 +60.0 140.0	8	14 19.7 +59.8 139.1	13 34.3 +59.9 139.2	12 48.8 +59.9 139.4	12 03.2 +60.0 139.5	11 17.6 +59.9 139.7	10 31.8 +60.0 139.8	9 45.9 +60.0 139.9	9 00.0 +60.0 140.0	9									
5	15 19.5 +59.8 139.0	14 34.2 +59.8 139.2	13 48.7 +59.9 139.3	13 03.2 +59.9 139.5	12 17.5 +60.0 139.6	11 31.8 +59.9 139.8	10 45.9 +60.0 139.9	10 00.0 +60.0 140.0	10	16 19.3 +59.8 138.9	15 34.0 +59.9 139.1	14 48.6 +59.9 139.3	14 03.1 +59.9 139.4	13 17.5 +59.9 139.6	12 31.7 +60.0 139.7	11 45.9 +60.0 139.9	11 00.0 +60.0 140.0	11									
6	17 19.1 +59.8 138.8	16 33.9 +59.8 139.0	15 48.5 +59.9 139.2	15 03.0 +60.0 139.4	14 17.4 +60.0 139.5	13 31.7 +60.0 139.7	12 45.9 +60.0 139.9	12 00.0 +60.0 140.0	12	18 18.9 +59.8 138.7	17 33.7 +59.9 138.9	16 48.4 +59.9 139.1	16 03.0 +59.9 139.3	15 17.4 +60.0 139.5	14 31.7 +60.0 139.7	13 45.9 +60.0 139.8	13 00.0 +60.0 140.0	13									
7	19 18.7 +59.8 138.6	18 33.6 +59.8 138.9	17 48.3 +59.9 139.1	17 02.9 +59.9 139.3	16 17.4 +60.0 139.5	15 31.7 +60.0 139.7	14 45.9 +60.0 139.8	14 00.0 +60.0 140.0	14	20 18.5 +59.8 138.5	19 33.4 +59.9 138.8	18 48.2 +59.9 139.0	18 02.8 +60.0 139.2	17 17.3 +60.0 139.4	16 31.7 +60.0 139.6	15 45.9 +60.0 139.8	15 00.0 +60.0 140.0	15									
8	21 18.3 +59.8 138.5	20 33.3 +59.8 138.7	19 48.1 +59.9 138.9	19 02.8 +59.9 139.2	18 17.3 +60.0 139.4	17 31.7 +60.0 139.6	16 45.9 +60.0 139.8	16 00.0 +60.0 140.0	16	22 18.1 +59.7 138.4	21 33.1 +59.9 138.6	20 48.0 +59.9 138.9	20 02.7 +59.9 139.1	19 17.3 +59.9 139.4	18 31.7 +59.9 139.6	17 45.9 +60.0 139.8	17 00.0 +60.0 140.0	17									
9	23 17.8 +59.8 138.3	22 33.0 +59.8 138.6	21 47.9 +59.9 138.8	21 02.6 +60.0 139.0	20 17.2 +60.0 139.3	19 31.6 +60.0 139.6	18 45.9 +60.0 139.8	18 00.0 +60.0 140.0	18	24 17.6 +59.8 138.2	23 32.8 +59.8 138.5	22 47.8 +59.9 138.8	22 02.6 +59.9 139.0	21 17.2 +59.9 139.3	20 31.6 +60.0 139.5	19 45.9 +60.0 139.8	19 00.0 +60.0 140.0	19									
10	25 17.4 +59.8 138.1	24 32.6 +59.9 138.4	23 47.7 +59.9 138.7	23 02.5 +59.9 139.0	22 17.1 +60.0 139.2	21 31.6 +60.0 139.5	20 45.9 +60.0 139.8	20 00.0 +60.0 140.0	20	26 17.2 +59.7 138.0	25 32.5 +59.8 138.3	24 47.6 +59.8 138.6	24 02.4 +60.0 138.9	23 17.1 +60.0 139.2	22 31.6 +60.0 139.5	21 45.9 +60.0 139.7	21 00.0 +60.0 140.0	21									
11	27 16.9 +59.8 137.9	26 32.3 +59.8 138.2	25 47.4 +59.9 138.6	25 02.4 +59.9 138.9	24 17.1 +59.9 139.2	23 31.6 +59.9 139.5	22 45.9 +60.0 139.7	22 00.0 +60.0 140.0	22	28 16.7 +59.8 137.8	27 32.1 +59.9 138.1	26 47.3 +59.9 138.5	26 02.3 +59.9 138.8	25 17.0 +60.0 139.1	24 31.5 +60.0 139.4	23 45.9 +60.0 139.7	23 00.0 +60.0 140.0	23									
12	29 16.5 +59.7 137.7	28 32.0 +59.8 138.1	27 47.2 +59.9 138.4	27 02.2 +59.9 138.6	26 17.0 +59.9 139.1	25 31.5 +60.0 139.4	24 45.9 +60.0 139.7	24 00.0 +60.0 140.0	24	30 16.2 +59.8 137.6	29 31.8 +59.8 138.0	28 47.1 +59.9 138.3	28 02.1 +60.0 138.7	27 16.9 +60.0 139.0	26 31.5 +60.0 139.4	25 45.9 +60.0 139.7	25 00.0 +60.0 140.0	25									
13	31 16.0 +59.7 137.5	30 31.6 +59.8 137.9	29 47.0 +59.8 138.3	29 02.1 +59.9 138.6	28 16.9 +59.9 139.0	27 31.5 +60.0 139.3	26 45.9 +60.0 139.7	26 00.0 +60.0 140.0	26	32 15.7 +59.7 137.4	31 31.4 +59.8 137.8	30 46.8 +59.9 138.2	30 02.0 +59.9 138.6	29 16.8 +60.0 139.0	28 31.5 +60.0 139.3	27 45.9 +59.9 139.7	27 00.0 +60.0 140.0	27									
14	33 15.4 +59.8 137.3	32 31.2 +59.8 137.7	31 46.7 +59.9 138.1	31 01.9 +59.9 138.5	30 16.8 +60.0 138.9	29 31.5 +59.9 139.3	28 45.8 +60.0 139.7	28 00.0 +60.0 140.0	28	34 15.2 +59.7 137.1	33 31.0 +59.8 137.6	32 46.6 +59.8 138.0	32 01.8 +59.9 138.5	31 16.8 +59.9 138.9	30 31.4 +60.0 139.3	29 45.8 +60.0 139.7	29 00.0 +60.0 140.0	29									
15	35 14.9 +59.7 137.0	34 30.8 +59.8 137.5	33 46.4 +59.9 138.0	33 01.7 +59.9 138.4	32 16.7 +60.0 138.8	31 31.4 +60.0 139.2	30 45.8 +60.0 139.6	30 00.0 +60.0 140.0	30	36 14.6 +59.7 136.9	35 30.6 +59.8 137.4	34 46.3 +59.9 137.9	34 01.6 +59.9 138.3	33 16.7 +59.9 138.8	32 31.4 +60.0 139.2	31 45.8 +60.0 139.6	31 00.0 +60.0 140.0	31									
16	37 14.3 +59.7 136.8	36 30.4 +59.8 137.3	35 46.2 +59.8 137.8	35 01.5 +60.0 138.3	34 16.6 +60.0 138.7	33 31.4 +60.0 139.3	32 45.8 +60.0 139.6	32 00.0 +60.0 140.0	32	38 14.0 +59.7 136.7	37 30.2 +59.8 137.2	36 46.0 +59.9 137.7	36 01.5 +59.9 138.2	35 16.5 +60.0 138.6	34 31.3 +60.0 139.1	33 45.8 +60.0 139.6	33 00.0 +60.0 140.0	33									
17	39 13.7 +59.7 136.5	38 30.0 +59.8 137.6	37 46.7 +59.9 137.1	37 01.4 +59.9 138.1	36 16.5 +60.0 138.6	35 31.3 +60.0 139.1	34 45.8 +60.0 139.5	34 00.0 +60.0 140.0	34	40 13.4 +59.7 136.4	39 29.8 +59.7 137.0	38 45.7 +59.9 137.5	38 01.3 +59.9 138.1	37 16.5 +59.9 138.6	36 31.3 +60.0 139.1	35 45.8 +60.0 139.5	35 00.0 +60.0 140.0	35									
18	41 13.1 +59.7 136.3	40 29.5 +59.8 136.9	39 45.6 +59.8 137.4	39 01.2 +59.9 138.0	38 16.4 +59.9 138.5	37 31.3 +60.0 139.0	36 45.8 +60.0 139.5	36 00.0 +60.0 140.0	36	42 12.8 +59.6 136.1	41 29.3 +59.8 136.7	40 45.4 +59.8 137.3	40 01.1 +59.9 137.9	39 16.3 +60.0 138.8	38 31.3 +59.9 139.0	37 45.8 +60.0 139.5	37 00.0 +60.0 140.0	37									
19	43 12.4 +59.7 136.0	42 29.1 +59.7 136.6	41 45.2 +59.9 137.2	41 01.0 +59.9 137.8	40 16.3 +60.0 138.4	39 31.2 +60.0 139.0	38 45.8 +60.0 139.5	38 00.0 +60.0 140.0	38	44 10.1 +59.6 135.0	43 28.7 +59.7 135.8	42 47.4 +59.8 136.6	42 00.3 +59.8 137.3	41 16.5 +60.0 138.0	40 31.2 +60.0 138.9	39 45.8 +60.0 139.5	39 00.0 +60.0 140.0	39									
20	45 11.7 +59.6 135.7	44 28.5 +59.8 136.4	43 44.9 +59.8 137.0	43 00.7 +59.9 137.7	42 16.2 +59.9 138.3	41 31.2 +59.9 138.9	40 45.8 +60.0 139.5	40 00.0 +60.0 140.0	40	46 11.3 +59.6 135.5	45 28.3 +59.7 136.2	44 44.7 +59.8 136.9	44 00.6 +59.9 137.6	43 16.1 +59.9 138.2	42 31.1 +60.0 138.8	41 45.8 +60.0 139.4	41 00.0 +60.0 140.0	41									
21	47 10.9 +59.6 135.3	46 28.0 +59.7 136.1	45 44.5 +59.8 136.8	45 00.5 +59.9 137.5	44 16.0 +60.0 138.2	43 31.1 +60.0 138.8	42 45.8 +60.0 139.4	42 00.0 +60.0 140.0	42	48 10.5 +59.6 135.2	47 27.7 +59.7 135.9	46 44.3 +59.8 136.7	46 00.4 +59.9 137.4	45 16.0 +60.0 138.1	44 31.1 +60.0 138.8	43 45.8 +60.0 139.4	43 00.0 +60.0 140.0	43									
22	49 10.1 +59.5 135.0	48 27.4 +59.7 135.8	47 44.1 +59.7 136.6	47 00.3 +59.8 137.3	46 15.9 +59.9 137.0	45 30.9 +60.0 137.7	44 45.7 +60.0 139.1	44 00.0 +60.0 140.0	44	50 09.7 +59.5 134.8	49 27.1 +59.6 135.6	48 43.9 +59.8 136.4	48 00.1 +59.9 137.2	47 15.8 +60.0 138.0	46 30.6 +60.0 138.7	45 45.7 +60.0 139.3	45 00.0 +60.0 140.0	45									
23	51 09.2 +59.5 134.6	50 26.7 +59.7 135.5	49 43.7 +59.7 136.3	49 00.0 +59.8 137.1	48 15.8 +59.9 137.9	47 31.0 +60.0 138.6	46 45.7 +60.0 139.3	46 00.0 +60.0 140.0	46	52 06.0 +59.3 133.2	51 24.4 +59.6 134.3	50 42.1 +59.7 135.4	50 05.9 +59.8 136.4	49 15.2 +59.9 137.4	48 30.8 +60.0 137.7	47 45.7 +60.0 139.3	47 00.0 +60.0 140.0	47									

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 40° , 320°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.			
	Hc	d	Z	Hc	d	Z																						
0	5 21.4 -59.8	139.8		4 35.6 -59.9	139.8		3 49.7 -59.9	139.9		3 03.8 -60.0	139.9		2 17.9 -60.0	140.0		1 31.9 -60.0	140.0		0 46.0 -60.0	140.0		0 00.0 +60.0	40.0		0			
1	4 21.6 -59.8	139.9		3 35.7 -59.9	139.9		2 49.8 -59.9	139.9		2 03.8 -59.9	140.0		1 17.9 -60.0	140.0		0 31.9 -60.0	140.0		0 14.0 +60.0	40.0		1 00.0 +60.0	40.0		1			
2	3 21.8 -59.8	139.9		2 35.8 -59.8	140.0		1 49.9 -59.9	140.0		1 03.9 -59.9	140.0		0 17.9 -59.9	140.0		0 28.1 +59.9	40.0		1 28.0 +60.0	39.9		2 14.0 +60.0	40.0		2			
3	2 22.0 -59.9	140.0		1 36.0 -59.9	140.0		0 50.0 -59.9	140.1		0 04.0 -60.0	140.1		0 42.0 +60.0	39.9		1 24.0 +60.0	39.9		2 14.0 +60.0	40.0		3 00.0 +60.0	40.0		3			
4	1 22.1 -59.8	140.1		0 36.1 -59.9	140.1		0 09.9 +59.9	39.9		0 56.0 +59.9	39.9		1 42.0 +60.0	39.9		2 42.0 +59.9	39.9		3 28.0 +60.0	39.9		4 14.0 +60.0	39.9		4 00.0 +60.0	40.0		4
5	0 22.3 -59.8	140.2		0 23.8 +59.8	39.8		1 09.8 +59.9	39.8		1 55.9 +59.9	39.8		2 42.0 +59.9	39.9		3 28.0 +60.0	39.9		4 14.0 +60.0	39.9		5 00.0 +60.0	40.0		5			
6	0 37.5 +59.8	39.7		1 23.6 +59.9	39.8		2 09.7 +59.9	39.8		2 55.8 +60.0	39.8		3 41.9 +60.0	39.8		4 28.0 +60.0	39.9		5 14.0 +60.0	39.9		6 00.0 +60.0	40.0		6			
7	1 37.3 +59.8	39.7		2 23.5 +59.8	39.7		3 09.6 +60.0	39.7		3 55.8 +59.9	39.8		4 41.9 +60.0	39.8		5 28.0 +60.0	39.9		6 14.0 +60.0	39.9		7 00.0 +60.0	40.0		7			
8	2 37.1 +59.8	39.6		3 23.3 +59.9	39.6		4 09.6 +59.9	39.7		4 55.7 +60.0	39.7		5 41.9 +59.9	39.8		6 28.0 +59.9	39.8		7 14.0 +60.0	39.9		8 00.0 +60.0	40.0		8			
9	3 36.9 +59.8	39.5		4 23.2 +59.9	39.5		5 09.5 +59.9	39.6		5 55.7 +59.9	39.7		6 41.8 +60.0	39.7		7 27.9 +60.0	39.8		8 14.0 +60.0	39.9		9 00.0 +60.0	40.0		9			
10	4 36.7 +59.9	39.4		5 23.1 +59.8	39.5		6 09.4 +59.9	39.5		6 55.6 +59.9	39.6		7 41.8 +60.0	39.7		8 27.9 +60.0	39.8		9 14.0 +60.0	39.9		10 00.0 +60.0	40.0		10			
11	5 36.6 +59.8	39.3		6 22.9 +59.9	39.4		7 09.3 +59.9	39.5		7 55.5 +60.0	39.6		8 41.8 +59.9	39.7		9 27.9 +60.0	39.8		10 14.0 +60.0	39.9		11 00.0 +60.0	40.0		11			
12	6 36.4 +59.8	39.3		7 22.8 +59.9	39.3		8 09.2 +59.9	39.4		8 55.5 +59.9	39.5		9 41.7 +60.0	39.6		10 27.9 +60.0	39.7		11 14.0 +60.0	39.9		12 00.0 +60.0	40.0		12			
13	7 36.2 +59.8	39.2		8 22.7 +59.8	39.3		9 09.1 +59.9	39.4		9 55.4 +60.0	39.5		10 41.7 +60.0	39.6		11 27.9 +60.0	39.7		12 14.0 +60.0	39.9		13 00.0 +60.0	40.0		13			
14	8 36.0 +59.8	39.1		9 22.5 +59.9	39.2		10 09.0 +59.9	39.3		10 55.4 +59.9	39.4		11 41.7 +59.9	39.6		12 27.9 +60.0	39.7		13 14.0 +60.0	39.8		14 00.0 +60.0	40.0		14			
15	9 35.8 +59.8	39.0		10 22.4 +59.8	39.1		11 08.9 +59.9	39.3		11 55.3 +59.9	39.4		12 41.6 +60.0	39.5		13 27.9 +59.9	39.7		14 14.0 +60.0	39.8		15 00.0 +60.0	40.0		15			
16	10 35.6 +59.8	38.9		11 22.2 +59.9	39.1		12 08.8 +59.9	39.2		12 55.2 +60.0	39.3		13 41.6 +59.9	39.5		14 27.8 +60.0	39.7		15 14.0 +60.0	39.8		16 00.0 +60.0	40.0		16			
17	11 35.4 +59.8	38.9		12 22.1 +59.9	39.0		13 08.7 +59.9	39.1		13 55.2 +59.9	39.3		14 41.5 +60.0	39.5		15 27.8 +60.0	39.6		16 14.0 +60.0	39.8		17 00.0 +60.0	40.0		17			
18	12 35.2 +59.8	38.8		13 22.0 +59.8	38.9		14 08.6 +59.9	39.1		14 55.1 +59.9	39.2		15 41.5 +60.0	39.4		16 27.8 +60.0	39.6		17 14.0 +60.0	39.8		18 00.0 +60.0	40.0		18			
19	13 35.0 +59.8	38.7		14 21.8 +59.9	38.9		15 08.5 +59.9	39.0		15 55.0 +60.0	39.2		16 41.5 +59.9	39.4		17 27.8 +60.0	39.6		18 14.0 +60.0	39.8		19 00.0 +60.0	40.0		19			
20	14 34.8 +59.8	38.6		15 21.7 +59.8	38.8		16 08.4 +59.9	39.0		16 55.0 +59.9	39.1		17 41.4 +60.0	39.3		18 27.8 +60.0	39.6		19 14.0 +60.0	39.8		20 00.0 +60.0	40.0		20			
21	15 34.6 +59.8	38.5		16 21.5 +59.9	38.7		17 08.3 +59.9	38.9		17 54.9 +59.9	39.1		18 41.4 +60.0	39.3		19 27.8 +59.9	39.5		20 14.0 +60.0	39.8		21 00.0 +60.0	40.0		21			
22	16 34.4 +59.8	38.4		17 21.4 +59.8	38.6		18 08.2 +59.9	38.8		18 54.8 +60.0	39.1		19 41.4 +59.9	39.3		20 27.7 +60.0	39.5		21 14.0 +59.9	39.7		22 00.0 +60.0	40.0		22			
23	17 34.2 +59.8	38.4		18 21.2 +59.9	38.6		19 08.1 +59.9	38.8		19 54.8 +59.9	39.0		20 41.3 +60.0	39.2		21 27.7 +60.0	39.5		22 13.9 +60.0	39.7		23 00.0 +60.0	40.0		23			
24	18 34.0 +59.8	38.3		19 21.1 +59.8	38.5		20 08.0 +59.9	38.7		20 54.7 +59.9	38.9		21 41.3 +59.9	39.2		22 27.7 +60.0	39.5		23 13.9 +60.0	39.7		24 00.0 +60.0	40.0		24			
25	19 33.8 +59.8	38.2		20 20.9 +59.9	38.4		21 07.9 +59.8	38.6		21 54.6 +60.0	38.9		22 41.2 +60.0	39.2		23 27.7 +60.0	39.4		24 13.9 +60.0	39.7		25 00.0 +60.0	40.0		25			
26	20 33.6 +59.8	38.1		21 20.8 +59.8	38.3		22 07.7 +59.9	38.6		22 54.6 +59.9	38.8		23 41.2 +60.0	39.1		24 27.7 +59.9	39.4		25 13.9 +60.0	39.7		26 00.0 +60.0	40.0		26			
27	21 33.4 +59.8	38.0		22 20.6 +59.8	38.3		23 07.6 +59.9	38.5		23 54.5 +59.9	38.8		24 41.2 +59.9	39.1		25 27.6 +60.0	39.4		26 13.9 +60.0	39.7		27 00.0 +60.0	40.0		27			
28	22 33.2 +59.8	37.9		23 20.4 +59.8	38.2		24 07.5 +59.9	38.5		24 54.4 +59.9	38.7		25 41.1 +60.0	39.0		26 27.6 +60.0	39.3		27 13.9 +60.0	39.7		28 00.0 +60.0	40.0		28			
29	23 33.0 +59.8	37.8		24 20.3 +59.8	38.1		25 07.4 +59.9	38.4		25 54.3 +60.0	38.7		26 41.1 +59.9	39.0		27 27.6 +60.0	39.3		28 13.9 +60.0	39.7		29 00.0 +60.0	40.0		29			
30	24 32.8 +59.7	37.7		25 20.1 +59.9	38.0		26 07.3 +59.9	38.3		26 54.3 +59.9	38.6		27 41.0 +60.0	38.9		28 27.6 +60.0	39.3		29 13.9 +60.0	39.6		30 00.0 +60.0	40.0		30			
31	25 32.5 +59.8	37.6		26 20.0 +59.8	37.9		27 07.2 +59.9	38.2		27 54.2 +59.9	38.6		28 41.0 +60.0	38.9		29 27.6 +60.0	39.3		30 13.9 +60.0	39.6		31 00.0 +60.0	40.0		31			
32	26 32.3 +59.8	37.5		27 19.8 +59.8	37.9		28 07.1 +59.8	38.2		28 54.1 +59.9	38.5		29 41.0 +59.9	38.9		30 27.6 +59.9	39.2		31 13.9 +60.0	39.6		32 00.0 +60.0	40.0		32			
33	27 32.1 +59.7	37.4		28 19.6 +59.8	37.8		29 06.9 +59.9	38.1		29 54.0 +60.0	38.5		30 40.9 +60.0	38.8		31 27.5 +60.0	39.2		32 13.9 +60.0	39.6		33 00.0 +60.0	40.0		33			
34	28 31.8 +59.8	37.3		29 19.4 +59.9	37.7		30 06.8 +59.9	38.0		30 54.0 +59.9	38.4		31 40.9 +59.9	38.8		32 27.5 +60.0	39.2		33 13.9 +60.0	39.6		34 00.0 +60.0	40.0		34			
35	29 31.6 +59.7	37.2		30 19.3 +59.8	37.6		31 06.7 +59.9	38.0		31 53.9 +59.9	38.3		32 40.8 +60.0	38.7		33 27.5 +60.0	39.1		34 13.9 +60.0	39.6		35 00.0 +60.0	40.0		35			
36	30 31.3 +59.8	37.1		31 19.1 +59.8	37.5		32 06.6 +59.8	37.9		32 53.8 +59.9	38.3		33 40.8 +59.9	38.7		34 27.5 +59.9	39.1		35 13.9 +60.0	39.5		36 00.0 +60.0	40.0		36			
37	31 31.1 +59.7	37.0		32 18.9 +59.8	37.4		33 06.4 +59.9	37.8		33 53.7 +59.9	38.2		34 40.7 +60.0	38.6		35 27.4 +60.0	39.1		36 13.9 +60.0	39.5		37 00.0 +60.0	40.0					

41°, 319° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.				
0	5	16.6	+59.8	138.8	4	31.5	+59.8	138.8	3	46.3	+59.9	138.9	3	01.1	+59.9	138.9	2	15.8	+60.0	139.0	1	30.6	+59.9	139.0	0	00.0	+60.0	139.0	0
1	6	16.4	+59.8	138.7	5	31.3	+59.9	138.8	4	46.2	+59.9	138.8	4	01.0	+59.9	138.9	3	15.8	+59.9	138.9	2	30.5	+60.0	139.0	1	45.3	+60.0	139.0	1
2	7	16.2	+59.8	138.6	6	31.2	+59.9	138.7	5	46.1	+59.9	138.8	5	00.9	+60.0	138.8	4	15.7	+60.0	138.9	3	30.5	+60.0	138.9	2	45.3	+60.0	139.0	2
3	8	16.1	+59.8	138.5	7	31.1	+59.8	138.6	6	46.0	+59.9	138.7	6	00.9	+59.9	138.8	5	15.7	+60.0	138.9	4	30.5	+60.0	138.9	3	45.3	+60.0	139.0	3
4	9	15.9	+59.8	138.5	8	30.9	+59.9	138.6	7	45.9	+59.9	138.7	7	00.8	+59.9	138.7	6	15.7	+59.9	138.8	5	30.5	+60.0	138.9	4	45.3	+60.0	139.0	4
5	10	15.7	+59.8	138.4	9	30.8	+59.8	138.5	8	45.8	+59.9	138.6	8	00.7	+60.0	138.7	7	15.6	+60.0	138.8	6	30.5	+60.0	138.9	5	45.3	+60.0	138.9	5
6	11	15.5	+59.8	138.3	10	30.6	+59.8	138.4	9	45.7	+59.9	138.5	9	00.7	+59.9	138.7	8	15.6	+60.0	138.8	7	30.5	+59.9	138.8	6	45.3	+60.0	139.0	6
7	12	15.3	+59.8	138.2	11	30.5	+59.8	138.4	10	45.6	+59.9	138.5	10	00.6	+60.0	138.6	9	15.6	+60.0	138.7	8	30.4	+60.0	138.8	7	45.3	+59.9	138.9	7
8	13	15.1	+59.8	138.1	12	30.3	+59.9	138.3	11	45.5	+59.9	138.4	11	00.6	+59.9	138.6	10	15.5	+60.0	138.7	9	30.4	+60.0	138.8	8	45.2	+60.0	139.0	8
9	14	14.9	+59.8	138.0	13	30.2	+59.8	138.2	12	45.4	+59.9	138.4	12	00.5	+59.9	138.5	11	15.5	+60.0	138.6	10	30.4	+60.0	138.8	9	45.2	+60.0	139.0	9
10	15	14.6	+59.8	138.0	14	30.0	+59.9	138.1	13	45.3	+59.9	138.3	13	00.4	+60.0	138.5	12	15.5	+59.9	138.6	11	30.4	+60.0	138.8	10	45.2	+60.0	139.0	10
11	16	14.4	+59.8	137.9	15	29.9	+59.8	138.1	14	45.2	+59.9	138.2	14	00.4	+59.9	138.4	13	15.4	+60.0	138.6	12	30.4	+60.0	138.7	11	45.2	+60.0	139.0	11
12	17	14.2	+59.8	137.8	16	29.7	+59.9	138.0	15	45.1	+59.9	138.2	15	00.3	+59.9	138.4	14	15.4	+59.9	138.5	13	30.4	+59.9	138.7	12	45.2	+60.0	139.0	12
13	18	14.0	+59.8	137.7	17	29.6	+59.8	137.9	16	45.0	+59.9	138.1	16	00.2	+60.0	138.3	15	15.3	+60.0	138.5	14	30.3	+60.0	138.7	13	45.2	+60.0	139.0	13
14	19	13.8	+59.8	137.6	18	29.4	+59.9	137.8	17	44.9	+59.8	138.1	17	00.2	+59.9	138.3	16	15.3	+60.0	138.5	15	30.3	+60.0	138.7	14	45.2	+60.0	139.0	14
15	20	13.6	+59.8	137.5	19	29.3	+59.8	137.8	18	44.7	+59.9	138.0	18	00.1	+59.9	138.2	17	15.3	+59.9	138.4	16	30.3	+60.0	138.6	15	45.2	+60.0	138.8	15
16	21	13.4	+59.7	137.4	20	29.1	+59.8	137.7	19	44.6	+59.9	137.9	19	00.0	+59.9	138.2	18	15.2	+60.0	138.4	17	30.3	+60.0	138.6	16	45.2	+60.0	139.0	16
17	22	13.1	+59.8	137.3	21	28.9	+59.8	137.6	20	44.5	+59.9	137.9	19	59.9	+60.0	138.1	19	15.2	+60.0	138.4	18	30.3	+60.0	138.6	17	45.2	+60.0	139.0	17
18	23	12.9	+59.8	137.2	22	28.8	+59.8	137.5	21	44.4	+59.9	137.8	20	59.9	+59.9	138.1	20	15.2	+60.0	138.3	19	30.3	+59.9	138.6	18	45.2	+60.0	139.0	18
19	24	12.7	+59.8	137.1	23	28.6	+59.8	137.4	22	44.3	+59.9	137.7	21	59.8	+59.9	138.0	21	15.1	+60.0	138.3	20	30.2	+60.0	138.5	19	45.2	+60.0	139.0	19
20	25	12.5	+59.7	137.0	24	28.4	+59.8	137.4	23	44.2	+59.9	137.7	22	59.7	+60.0	138.0	22	15.1	+59.9	138.2	21	30.2	+60.0	138.5	20	45.2	+60.0	139.0	20
21	26	12.2	+59.6	136.9	25	28.3	+59.8	137.3	24	44.1	+59.8	137.6	23	59.7	+59.9	137.9	23	15.0	+60.0	138.2	22	30.2	+60.0	138.5	21	45.2	+60.0	139.0	21
22	27	12.0	+59.7	136.8	26	28.1	+59.8	137.2	25	43.9	+59.9	137.5	24	59.6	+59.9	137.8	24	15.0	+59.9	138.2	23	30.2	+60.0	138.4	22	45.2	+60.0	139.0	22
23	28	11.7	+59.8	136.7	27	27.9	+59.8	137.1	26	43.8	+59.9	137.5	25	59.5	+59.9	137.8	25	14.9	+60.0	138.1	24	30.2	+60.0	138.4	23	45.2	+60.0	139.0	23
24	29	11.5	+59.7	136.6	28	27.7	+59.8	137.0	27	43.7	+59.9	137.4	26	59.4	+59.9	137.7	26	14.9	+60.0	138.1	25	30.2	+59.9	138.4	24	45.2	+60.0	139.0	24
25	30	11.2	+59.8	136.5	29	27.5	+59.8	136.9	28	43.6	+59.8	137.3	27	59.3	+60.0	137.7	27	14.9	+59.9	138.0	26	30.1	+60.0	138.4	25	45.2	+60.0	139.0	25
26	31	11.0	+59.7	136.4	30	27.4	+59.8	136.8	29	43.4	+59.8	137.2	28	59.3	+59.9	137.6	28	14.8	+60.0	138.0	27	30.1	+60.0	138.3	26	45.2	+60.0	139.0	26
27	32	10.7	+59.7	136.3	31	27.2	+59.8	136.7	30	43.3	+59.9	137.2	29	59.2	+59.9	137.6	29	14.8	+59.9	137.9	28	30.1	+59.9	138.3	27	45.2	+60.0	139.0	27
28	33	10.4	+59.8	136.2	32	27.0	+59.8	136.7	31	43.2	+59.8	137.1	30	59.1	+59.9	137.5	30	14.7	+60.0	137.9	29	30.1	+59.9	138.6	28	45.2	+60.0	139.0	28
29	34	10.2	+59.7	136.1	33	26.8	+59.8	136.6	32	43.0	+59.9	137.0	31	59.0	+59.9	137.4	31	14.7	+59.9	137.8	30	30.0	+60.0	138.2	29	45.2	+60.0	139.0	29
30	35	09.9	+59.7	136.0	34	26.6	+59.7	136.5	33	42.9	+59.9	136.9	32	58.9	+59.9	137.4	32	14.6	+60.0	137.8	31	30.0	+60.0	138.2	30	45.2	+59.9	138.6	30
31	36	09.6	+59.7	135.9	35	26.3	+59.8	136.4	34	42.8	+59.8	136.8	33	58.8	+59.9	137.3	33	14.6	+59.9	137.7	32	30.0	+60.0	138.2	31	45.2	+60.0	139.0	31
32	37	09.3	+59.7	135.7	36	26.1	+59.8	136.2	35	42.6	+59.8	136.7	34	58.7	+59.9	137.2	34	14.5	+60.0	137.7	33	30.0	+60.0	138.1	32	45.1	+60.0	139.0	32
33	38	09.0	+59.7	135.6	37	25.9	+59.8	136.1	36	42.5	+59.8	136.6	35	58.6	+59.9	137.0	35	14.5	+59.9	137.6	34	30.0	+59.9	138.1	33	45.1	+60.0	139.0	33
34	39	08.7	+59.6	135.5	38	25.7	+59.8	135.4	37	42.3	+59.8	135.4	36	58.5	+59.8	136.2	37	14.7	+59.8	136.9	36	29.9	+60.0	137.5	35	45.1	+60.0	139.0	34
35	40	08.3	+59.7	135.3	39	25.4	+59.8	135.9	38	42.1	+59.9	136.5	37	58.4	+59.9	137.0	37	14.4	+59.9	137.5	36	29.9	+60.0	138.0	35	45.1	+60.0	139.0	35
36	41	08.0	+59.7	135.2	40	25.2	+59.8	135.8	39	42.0	+59.8	136.4	38	58.3	+59.9	136.9	38	14.3	+59.9	137.5	37	29.9	+60.0	138.0	36	45.1	+60.0	139.0	36
37	42	07.7	+59.6	135.1	41	25.																							

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 41° , 319°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	5	16.6	-59.8	138.8	4	31.5	-59.9	138.8	3	46.3	-59.9	138.9	3	01.1	-60.0	138.9	2	15.8	-59.9	139.0	1	30.6	-60.0	139.0	0	45.3	-60.0	139.0	0	0.00	+60.0	41.0	0
1	4	16.8	-59.8	138.9	3	31.6	-59.8	138.9	2	46.4	-59.9	138.9	2	01.1	-59.9	139.0	1	15.9	-60.0	139.0	0	30.6	-60.0	139.0	0	14.7	+60.0	41.0	1				
2	3	17.0	-59.8	138.9	2	31.8	-59.9	139.0	1	46.5	-59.9	139.0	1	01.2	-59.9	139.0	0	15.9	-60.0	139.0	0	29.4	+60.0	41.0	2								
3	2	17.2	-59.8	139.0	1	31.9	-59.9	139.1	0	46.6	-59.9	139.1	0	01.3	-60.0	139.1	0	44.1	+59.9	40.9	1	29.4	+60.0	41.0	3								
4	1	17.4	-59.8	139.1	0	32.0	-59.8	139.1	0	13.3	+59.9	40.9	0	58.7	+59.9	40.9	1	44.0	+60.0	40.9	2	29.4	+60.0	41.0	4								
5	0	17.6	-59.8	139.2	0	27.8	+59.9	40.8	1	13.2	+59.9	40.8	1	58.6	+60.0	40.8	2	44.0	+60.0	40.9	3	29.4	+59.9	40.9	4	14.7	+60.0	40.9	5				
6	0	42.2	+59.8	40.7	1	27.7	+59.8	40.7	2	13.1	+59.9	40.8	2	58.6	+59.9	40.8	3	44.0	+59.9	40.8	4	29.3	+60.0	40.9	5	14.7	+60.0	40.9	6				
7	1	42.0	+59.8	40.7	2	27.5	+59.9	40.7	3	13.0	+59.9	40.7	3	58.5	+59.9	40.7	4	43.9	+60.0	40.8	5	29.3	+60.0	40.9	6	14.7	+60.0	40.9	7				
8	2	41.8	+59.8	40.6	3	27.4	+59.8	40.6	4	12.9	+59.9	40.7	4	58.4	+60.0	40.7	5	43.9	+60.0	40.8	6	29.3	+60.0	40.9	7	14.7	+60.0	40.9	8				
9	3	41.6	+59.8	40.5	4	27.2	+59.9	40.5	5	12.8	+59.9	40.6	5	58.4	+59.9	40.7	6	43.9	+59.9	40.7	7	29.3	+60.0	40.8	8	14.7	+60.0	40.9	9				
10	4	41.4	+59.8	40.4	5	27.1	+59.9	40.5	6	12.7	+59.9	40.5	6	58.3	+59.9	40.6	7	43.8	+60.0	40.7	8	29.3	+60.0	40.8	9	14.7	+60.0	40.9	10				
11	5	41.2	+59.8	40.3	6	27.0	+59.8	40.4	7	12.6	+59.9	40.5	7	58.2	+60.0	40.6	8	43.8	+60.0	40.7	9	29.3	+60.0	40.8	10	14.7	+60.0	40.9	11				
12	6	41.0	+59.9	40.2	7	26.8	+59.9	40.3	8	12.5	+59.9	40.4	8	58.2	+59.9	40.5	9	43.8	+59.9	40.6	10	29.3	+59.9	40.7	11	14.7	+60.0	40.9	12				
13	7	40.9	+59.8	40.2	8	26.7	+59.8	40.3	9	12.4	+59.9	40.4	9	58.1	+59.9	40.5	10	43.7	+60.0	40.6	11	29.2	+60.0	40.7	12	14.7	+60.0	40.9	13				
14	8	40.7	+59.8	40.1	10	12.3	+59.9	40.3	10	58.0	+60.0	40.4	11	43.7	+59.9	40.6	12	29.2	+60.0	40.7	13	14.7	+60.0	40.8	14								
15	9	40.5	+59.8	40.0	10	26.4	+59.8	40.1	11	12.2	+59.9	40.2	11	58.0	+59.9	40.4	12	43.6	+60.0	40.5	13	29.2	+60.0	40.7	14	14.7	+60.0	40.8	15				
16	10	40.3	+59.8	39.9	11	26.2	+59.9	40.0	12	12.1	+59.9	40.2	12	57.9	+59.9	40.3	13	43.6	+60.0	40.5	14	29.2	+60.0	40.6	15	14.7	+59.9	40.8	16				
17	11	40.1	+59.8	39.8	12	26.1	+59.8	40.0	13	12.0	+59.9	40.1	13	57.8	+60.0	40.3	14	43.6	+59.9	40.4	15	29.2	+60.0	40.6	16	14.6	+60.0	40.8	17				
18	12	39.9	+59.8	39.8	13	25.9	+59.9	39.9	14	11.9	+59.9	40.1	14	57.8	+59.9	40.2	15	43.5	+60.0	40.4	16	29.2	+59.9	40.6	17	14.6	+60.0	40.8	18				
19	13	39.7	+59.8	39.7	14	25.8	+59.8	39.8	15	11.8	+59.9	40.0	15	57.7	+59.9	40.2	16	43.5	+60.0	40.4	17	29.1	+60.0	40.6	18	14.6	+60.0	40.8	19				
20	14	39.5	+59.7	39.6	15	25.6	+59.9	39.8	16	11.7	+59.9	39.9	16	57.6	+60.0	40.1	17	43.5	+59.9	40.3	18	29.1	+60.0	40.5	19	14.6	+60.0	40.8	20				
21	15	39.2	+59.8	39.5	16	25.5	+59.8	39.7	17	11.6	+59.9	39.9	17	57.6	+59.9	40.1	18	43.4	+60.0	40.3	19	29.1	+60.0	40.5	20	14.6	+60.0	40.8	21				
22	16	39.0	+59.8	39.4	17	25.3	+59.9	39.6	18	11.5	+59.9	39.8	18	57.5	+59.9	40.0	19	43.4	+59.9	40.3	20	29.1	+60.0	40.5	21	14.6	+60.0	40.7	22				
23	17	38.8	+59.8	39.3	18	25.2	+59.8	39.5	19	11.4	+59.9	39.7	19	57.4	+60.0	40.0	20	43.3	+60.0	40.2	21	29.1	+59.9	40.5	22	14.6	+60.0	40.7	23				
24	18	38.6	+59.8	39.2	19	25.0	+59.9	39.5	20	11.3	+59.9	39.7	20	57.4	+59.9	39.9	21	43.3	+59.9	40.2	22	29.0	+60.0	40.4	23	14.6	+60.0	40.7	24				
25	19	38.4	+59.8	39.1	20	24.9	+59.8	39.4	21	11.2	+59.8	39.6	21	57.3	+59.9	39.9	22	43.2	+60.0	40.1	23	29.0	+60.0	40.4	24	14.6	+60.0	40.7	25				
26	20	38.2	+59.8	39.1	21	24.7	+59.8	39.3	22	11.0	+59.9	39.6	22	57.2	+59.9	39.8	23	43.2	+60.0	40.1	24	29.0	+60.0	40.4	25	14.6	+60.0	40.7	26				
27	21	38.0	+59.7	39.0	22	24.5	+59.9	39.2	23	10.9	+59.9	39.5	23	57.1	+60.0	39.8	24	43.2	+59.9	40.1	25	29.0	+60.0	40.4	26	14.6	+60.0	40.7	27				
28	22	37.7	+59.8	38.8	23	24.4	+59.8	39.1	24	10.8	+59.9	39.4	24	57.1	+59.9	39.7	25	43.1	+60.0	40.0	26	29.0	+60.0	40.3	27	14.6	+60.0	40.7	28				
29	23	37.5	+59.8	38.8	24	24.2	+59.8	39.1	25	10.7	+59.9	39.3	25	57.0	+59.9	39.7	26	43.1	+59.9	40.0	27	29.0	+59.9	40.3	28	14.6	+60.0	40.6	29				
30	24	37.3	+59.7	38.7	25	24.0	+59.8	39.0	26	10.6	+59.8	39.3	26	56.9	+59.9	39.6	27	43.0	+60.0	39.9	28	28.9	+60.0	40.3	29	14.6	+60.0	40.6	30				
31	25	37.0	+59.8	38.6	26	23.8	+59.9	38.9	27	10.4	+59.9	39.2	27	56.8	+59.9	39.5	28	43.0	+59.9	39.9	29	28.9	+60.0	40.6	31	14.6	+60.0	40.7	31				
32	26	36.8	+59.8	38.5	27	23.7	+59.8	38.8	28	10.3	+59.9	39.1	28	56.7	+60.0	39.5	29	42.9	+60.0	39.8	30	28.9	+60.0	40.2	31	14.6	+60.0	40.6	32				
33	27	36.6	+59.7	38.4	28	23.5	+59.8	38.7	29	10.2	+59.9	39.1	29	56.7	+59.9	39.4	30	42.9	+59.9	39.8	31	28.9	+59.9	40.2	33	14.6	+60.0	40.6	33				
34	28	36.3	+59.8	38.3	29	23.3	+59.8	38.6	30	10.1	+59.8	39.0	30	56.6	+59.9	39.4	31	42.8	+60.0	39.7	32	28.8	+60.0	40.4	34	14.6	+60.0	40.6	34				
35	29	36.1	+59.7	38.2	30	23.1	+59.8	38.5	31	09.9	+59.9	38.9	31	56.5	+59.9	39.3	32	42.8	+59.9	39.7	33	28.8	+60.0	40.1	34	14.6	+60.0	40.5	35				
36	30	35.8	+59.7	38.1	31	22.9	+59.8	38.4	32	09.8	+59.9	38.8	32	56.4	+59.9	39.2	33	42.7	+60.0	39.6	34	28.8	+60.0	40.1	35	14.6	+60.0	40.5	36				
37	31	35.5	+59.8	38.0	32	22.7	+59.8	38.3	33	09.7	+59.8	38.7	33	56.3	+59.9	39.2	34	42.7	+59.9	39.6	35	28.8	+60.0	40.4	37	14.6	+60.0	40.6	37				
38	32	35.3	+59.7	37.8	33	22.5	+59.8	38.2	34	09.5	+59.9	38.7	34	56.2	+59.9	39.1	35	42.6	+60.0	39.5	36												

42°, 318° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Dec.																					
0	5 11.8	+59.8	137.8	4 27.3	+59.9	137.8	3 42.8	+59.9	137.9	2 58.3	+59.9	137.9	2 13.7	+60.0	138.0	1 29.2	+60.0	138.0	0 44.6	+60.0	138.0	0 00.0	+60.0	138.0	0
1	6 11.6	+59.8	137.7	5 27.2	+59.8	137.8	4 42.7	+59.9	137.8	3 58.2	+60.0	137.9	3 13.7	+60.0	137.9	2 29.2	+59.9	138.0	1 44.6	+60.0	138.0	1 00.0	+60.0	138.0	1
2	7 11.4	+59.8	137.6	6 27.0	+59.9	137.7	5 42.6	+59.9	137.8	4 58.2	+59.9	137.8	4 13.7	+59.9	137.9	3 29.1	+60.0	137.9	2 44.6	+60.0	138.0	2 00.0	+60.0	138.0	2
3	8 11.2	+59.8	137.5	7 26.9	+59.8	137.6	6 42.5	+59.9	137.7	5 58.1	+59.9	137.8	5 13.6	+60.0	137.9	4 29.1	+60.0	137.9	3 44.6	+60.0	138.0	3 00.0	+60.0	138.0	3
4	9 11.0	+59.8	137.5	8 26.7	+59.9	137.6	7 42.4	+59.9	137.7	6 58.0	+60.0	137.7	6 13.6	+60.0	137.8	5 29.1	+60.0	137.9	4 44.6	+60.0	138.0	4 00.0	+60.0	138.0	4
5	10 10.8	+59.7	137.4	9 26.6	+59.8	137.5	8 42.3	+59.9	137.6	7 58.0	+59.9	137.7	7 13.6	+59.9	137.8	6 29.1	+60.0	137.9	5 44.6	+60.0	138.0	5 00.0	+60.0	138.0	5
6	11 10.5	+59.8	137.3	10 26.4	+59.9	137.4	9 42.2	+59.9	137.5	8 57.9	+59.9	137.6	8 13.5	+60.0	137.7	7 29.1	+60.0	137.8	6 44.6	+60.0	137.9	6 00.0	+60.0	138.0	6
7	12 10.3	+59.8	137.2	11 26.3	+59.8	137.3	10 42.1	+59.9	137.5	9 57.8	+60.0	137.6	9 13.5	+59.9	137.7	8 29.1	+59.9	137.8	7 44.6	+60.0	137.9	7 00.0	+60.0	138.0	7
8	13 10.1	+59.8	137.1	12 26.1	+59.9	137.3	11 42.0	+59.9	137.4	10 57.8	+59.9	137.6	10 13.4	+60.0	137.7	9 29.0	+60.0	137.8	8 44.6	+60.0	137.9	8 00.0	+60.0	138.0	8
9	14 09.9	+59.8	137.0	13 26.0	+59.8	137.2	12 41.9	+59.9	137.4	11 57.7	+59.9	137.5	11 13.4	+60.0	137.6	10 29.0	+59.9	137.8	9 44.6	+59.9	137.9	9 00.0	+60.0	138.0	9
10	15 09.7	+59.8	136.9	14 25.8	+59.8	137.1	13 41.8	+59.9	137.3	12 57.6	+60.0	137.5	12 13.4	+59.9	137.6	11 29.0	+60.0	137.7	10 44.5	+60.0	137.9	10 00.0	+60.0	138.0	10
11	16 09.5	+59.8	136.9	15 25.6	+59.9	137.0	14 41.7	+59.9	137.2	13 57.6	+59.9	137.4	13 13.3	+60.0	137.6	12 29.0	+60.0	137.7	11 44.5	+60.0	137.9	11 00.0	+60.0	138.0	11
12	17 09.3	+59.8	136.8	16 25.5	+59.8	137.0	15 41.6	+59.8	137.2	14 57.5	+59.9	137.4	14 13.3	+59.9	137.5	13 29.0	+60.0	137.7	12 44.5	+60.0	137.9	12 00.0	+60.0	138.0	12
13	18 09.1	+59.7	136.7	17 25.3	+59.8	136.9	16 41.4	+59.9	137.1	15 57.4	+59.9	137.3	15 13.2	+60.0	137.5	14 29.0	+59.9	137.7	13 44.5	+60.0	137.8	13 00.0	+60.0	138.0	13
14	19 08.8	+59.8	136.6	18 25.2	+59.8	136.8	17 41.3	+59.9	137.0	16 57.3	+60.0	137.3	16 13.2	+60.0	137.5	15 28.9	+60.0	137.6	14 44.5	+60.0	137.8	14 00.0	+60.0	138.0	14
15	20 08.6	+59.8	136.5	19 25.0	+59.8	136.7	18 41.2	+59.9	137.0	17 57.3	+59.9	137.2	17 13.2	+59.9	137.4	16 28.9	+60.0	137.6	15 44.5	+60.0	137.8	15 00.0	+60.0	138.0	15
16	21 08.4	+59.7	136.4	20 24.8	+59.9	136.7	19 41.1	+59.9	136.9	18 57.2	+59.9	137.2	18 13.1	+60.0	137.4	17 28.9	+60.0	137.6	16 44.5	+60.0	137.8	16 00.0	+60.0	138.0	16
17	22 08.1	+59.8	136.3	21 24.7	+59.8	136.6	20 41.0	+59.9	136.8	19 57.1	+59.9	137.1	19 13.1	+59.9	137.3	18 28.9	+60.0	137.6	17 44.5	+60.0	137.8	17 00.0	+60.0	138.0	17
18	23 07.9	+59.8	136.2	22 24.5	+59.8	136.5	21 40.9	+59.8	136.8	20 57.0	+60.0	137.0	20 13.0	+60.0	137.3	19 28.9	+59.9	137.5	18 44.5	+60.0	137.8	18 00.0	+60.0	138.0	18
19	24 07.7	+59.7	136.1	23 24.3	+59.8	136.4	22 40.7	+59.9	136.7	21 57.0	+59.9	137.0	21 13.0	+60.0	137.3	20 28.8	+60.0	137.5	19 44.5	+60.0	137.8	19 00.0	+60.0	138.0	19
20	25 07.4	+59.8	136.0	24 24.1	+59.9	136.3	23 40.6	+59.9	136.6	22 56.9	+59.9	136.9	22 13.0	+59.9	137.2	21 28.8	+60.0	137.5	20 44.5	+60.0	137.8	20 00.0	+60.0	138.0	20
21	26 07.2	+59.7	135.9	25 24.0	+59.8	136.2	24 40.5	+59.9	136.6	23 56.8	+59.9	136.9	23 12.9	+60.0	137.2	22 28.8	+60.0	137.5	21 44.5	+60.0	137.7	21 00.0	+60.0	138.0	21
22	27 06.9	+59.8	135.8	26 23.8	+59.8	136.2	25 40.4	+59.8	136.5	24 56.7	+60.0	136.8	24 12.9	+59.9	137.1	23 28.8	+60.0	137.4	22 44.5	+60.0	137.7	22 00.0	+60.0	138.0	22
23	28 06.7	+59.7	135.7	27 23.6	+59.8	136.1	26 40.3	+59.8	136.4	25 56.7	+59.9	136.8	25 12.8	+60.0	137.1	24 28.8	+59.9	137.4	23 44.5	+60.0	137.7	23 00.0	+60.0	138.0	23
24	29 06.4	+59.8	135.6	28 23.4	+59.8	136.0	27 40.1	+59.9	136.4	26 56.6	+59.9	136.7	26 12.8	+59.9	137.1	25 28.7	+60.0	137.4	24 44.5	+60.0	137.7	24 00.0	+60.0	138.0	24
25	30 06.2	+59.7	135.5	29 23.2	+59.8	135.9	28 40.0	+59.9	136.3	27 56.5	+59.9	136.6	27 12.7	+60.0	137.0	26 28.7	+60.0	137.4	25 44.5	+60.0	137.7	25 00.0	+60.0	138.0	25
26	31 05.9	+59.7	135.4	30 23.0	+59.8	135.8	29 39.9	+59.8	136.2	28 56.4	+59.9	136.5	28 12.7	+59.9	137.0	27 28.7	+60.0	137.3	26 44.5	+60.0	137.7	26 00.0	+60.0	138.0	26
27	32 05.6	+59.7	135.3	31 22.8	+59.8	135.7	30 39.7	+59.9	136.1	29 56.3	+59.9	136.5	29 12.6	+60.0	136.9	28 28.7	+60.0	137.3	27 44.5	+60.0	137.7	27 00.0	+60.0	138.0	27
28	33 05.3	+59.7	135.2	32 22.6	+59.8	135.6	31 39.6	+59.8	136.0	30 56.2	+59.9	136.5	30 12.6	+59.9	136.9	29 28.7	+59.9	137.3	28 44.5	+60.0	137.6	28 00.0	+60.0	138.0	28
29	34 05.0	+59.7	135.0	33 22.4	+59.8	135.5	32 39.4	+59.9	136.0	31 56.1	+60.0	136.4	31 12.5	+60.0	136.8	30 28.6	+60.0	137.2	29 44.5	+60.0	137.6	29 00.0	+60.0	138.0	29
30	35 04.7	+59.7	134.9	34 22.2	+59.8	135.4	33 39.3	+59.8	135.9	32 56.1	+59.9	136.3	32 12.5	+59.9	136.8	31 28.6	+60.0	137.2	30 44.5	+59.9	137.6	30 00.0	+60.0	138.0	30
31	36 04.4	+59.7	134.8	35 22.0	+59.8	135.3	34 39.1	+59.9	135.8	33 56.0	+59.9	136.3	33 12.4	+60.0	136.7	32 28.6	+60.0	137.2	31 44.4	+60.0	137.6	31 00.0	+60.0	138.0	31
32	37 04.1	+59.7	134.7	36 21.8	+59.7	135.2	35 39.0	+59.8	135.7	34 55.9	+59.9	136.2	34 12.4	+59.9	136.7	33 28.6	+59.9	137.1	32 44.4	+60.0	137.6	32 00.0	+60.0	138.0	32
33	38 03.8	+59.7	134.5	37 21.5	+59.8	135.1	36 38.8	+59.9	135.6	35 55.8	+59.9	136.1	35 12.3	+60.0	136.6	34 28.5	+60.0	137.1	33 44.4	+60.0	137.6	33 00.0	+60.0	138.0	33
34	39 03.5	+59.6	134.4	38 21.3	+59.7	135.0	37 38.7	+59.8	135.5	36 55.7	+59.8	135.4	37 11.6	+59.9	135.9	36 28.5	+60.0	137.5	35 44.4	+60.0	137.8	35 00.0	+60.0	138.0	34
35	40 03.1	+59.7	134.3	39 21.0	+59.8	134.9	38 38.5	+59.8	135.4	37 55.6	+59.9	136.0	37 12.2	+60.0	136.5	36 28.5	+60.0	137.0	35 44.4	+60.0	137.5	35 00.0	+60.0	138.0	35
36	41 02.8	+59.6	134.1	40 20.8	+59.7	134.7	39 38.3	+59.9	135.3	38 55.5	+59.8	135.9	38 12.2	+59.9	136.5	37 28.5	+59.9	137.0	36 44.4	+60.0	137.				

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 42°, 318°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	5	11.8	-59.8	137.8	4	27.3	-59.8	137.8	3	42.8	-59.9	137.9	2	58.3	-59.9	137.9	2	13.7	-59.9	138.0	1	29.2	-60.0	138.0	0	44.6	-60.0	138.0	0	0.00	+60.0	42.0	0
1	4	12.0	-59.8	137.9	3	27.5	-59.9	137.9	2	42.9	-59.9	137.9	1	58.4	-60.0	138.0	1	13.8	-60.0	138.0	0	29.2	-60.0	138.0	0	15.4	+60.0	42.0	1				
2	3	12.2	-59.8	138.0	2	27.6	-59.8	138.0	1	43.0	-59.9	138.0	0	58.4	-59.9	138.0	0	13.8	-60.0	138.0	0	30.8	+60.0	42.0	2	0.00	+60.0	42.0	2				
3	2	12.4	-59.8	138.0	1	27.8	-59.9	138.1	0	43.1	-59.9	138.1	0	0.15	+59.9	41.9	0	46.2	+59.9	41.9	1	30.8	+60.0	41.9	2	15.4	+60.0	42.0	3				
4	1	12.6	-59.8	138.1	0	27.9	-59.9	138.1	0	16.8	+59.9	41.9	1	0.14	+60.0	41.9	1	46.1	+60.0	41.9	2	30.8	+59.9	41.9	3	15.4	+60.0	42.0	4				
5	0	12.8	-59.8	138.2	0	32.0	+59.8	41.8	1	16.7	+59.9	41.8	2	0.14	+59.9	41.8	2	46.1	+59.9	41.9	3	30.7	+60.0	41.9	4	15.4	+60.0	41.9	5				
6	0	47.0	+59.8	41.7	1	31.8	+59.9	41.7	2	16.6	+59.9	41.8	3	0.13	+60.0	41.8	3	46.0	+60.0	41.8	4	30.7	+60.0	41.9	5	15.4	+60.0	41.9	6				
7	1	46.8	+59.8	41.6	2	31.7	+59.8	41.7	3	16.5	+59.9	41.7	4	0.13	+59.9	41.7	4	46.0	+60.0	41.8	5	30.7	+60.0	41.9	6	15.4	+60.0	41.9	7				
8	2	46.6	+59.8	41.6	3	31.5	+59.9	41.6	4	16.4	+59.9	41.6	5	0.12	+59.9	41.7	5	46.0	+59.9	41.8	6	30.7	+60.0	41.8	7	15.4	+60.0	42.0	8				
9	3	46.4	+59.8	41.5	4	31.4	+59.8	41.5	5	16.3	+59.9	41.6	6	0.11	+60.0	41.6	6	45.9	+60.0	41.7	7	30.7	+60.0	41.8	8	15.4	+60.0	42.0	9				
10	4	46.2	+59.8	41.4	5	31.2	+59.9	41.5	6	16.2	+59.9	41.5	7	0.11	+59.9	41.6	7	45.9	+60.0	41.7	8	30.7	+59.9	41.8	9	15.4	+60.0	41.9	10				
11	5	46.0	+59.8	41.3	6	31.1	+59.8	41.4	7	16.1	+59.9	41.5	8	0.10	+59.9	41.6	8	45.9	+59.9	41.7	9	30.6	+60.0	41.8	10	15.4	+60.0	41.9	11				
12	6	45.8	+59.8	41.2	7	30.9	+59.9	41.3	8	16.0	+59.8	41.4	9	0.09	+60.0	41.5	9	45.8	+60.0	41.6	10	30.6	+60.0	41.7	11	15.4	+60.0	41.9	12				
13	7	45.6	+59.8	41.1	8	30.8	+59.8	41.2	9	15.8	+59.9	41.3	10	0.09	+59.9	41.5	10	45.8	+59.9	41.6	11	30.6	+60.0	41.7	12	15.4	+60.0	41.9	13				
14	8	45.4	+59.8	41.1	9	30.6	+59.9	41.2	10	15.7	+59.9	41.3	11	0.08	+59.9	41.4	11	45.7	+60.0	41.5	12	30.6	+60.0	41.7	13	15.4	+59.9	41.8	14				
15	9	45.2	+59.8	41.0	10	30.5	+59.8	41.1	11	15.6	+59.9	41.2	12	0.07	+59.9	41.4	12	45.7	+60.0	41.5	13	30.6	+60.0	41.7	14	15.3	+60.0	41.8	15				
16	10	45.0	+59.8	40.9	11	30.3	+59.9	41.0	12	15.5	+59.9	41.2	13	0.06	+60.0	41.3	13	45.7	+59.9	41.5	14	30.6	+59.9	41.6	15	15.3	+60.0	41.8	16				
17	11	44.8	+59.8	40.8	12	30.2	+59.8	41.0	13	15.4	+59.9	41.1	14	0.06	+59.9	41.3	14	45.6	+60.0	41.4	15	30.5	+60.0	41.6	16	15.3	+60.0	41.8	17				
18	12	44.6	+59.8	40.7	13	30.0	+59.8	40.9	14	15.3	+59.9	41.0	15	0.05	+59.9	41.2	15	45.6	+59.9	41.4	16	30.5	+60.0	41.6	17	15.3	+60.0	41.8	18				
19	13	44.4	+59.8	40.6	14	29.8	+59.8	40.8	15	15.2	+59.9	41.0	16	0.04	+60.0	41.2	16	45.5	+60.0	41.4	17	30.5	+60.0	41.6	18	15.3	+60.0	42.0	19				
20	14	44.2	+59.7	40.6	15	29.7	+59.8	40.7	16	15.1	+59.9	40.9	17	0.04	+59.9	41.1	17	45.5	+60.0	41.3	18	30.5	+60.0	41.5	19	15.3	+60.0	41.8	20				
21	15	43.9	+59.8	40.5	16	29.5	+59.8	40.7	17	15.0	+59.9	40.9	18	0.03	+59.9	41.1	18	45.5	+59.9	41.3	19	30.5	+60.0	41.5	20	15.3	+60.0	41.7	21				
22	16	43.7	+59.8	40.4	17	29.4	+59.8	40.6	18	14.9	+59.9	40.8	19	0.02	+59.9	41.0	19	45.4	+60.0	41.2	20	30.5	+59.9	41.5	21	15.3	+60.0	41.7	22				
23	17	43.5	+59.8	40.3	18	29.2	+59.8	40.5	19	14.8	+59.8	40.7	20	0.01	+60.0	41.0	20	45.4	+59.9	41.2	21	30.4	+60.0	41.5	22	15.3	+60.0	42.0	23				
24	18	43.3	+59.8	40.2	19	29.0	+59.9	40.4	20	14.6	+59.9	40.7	21	0.01	+59.9	40.9	21	45.3	+60.0	41.2	22	30.4	+60.0	41.4	23	15.3	+60.0	42.0	24				
25	19	43.1	+59.7	40.1	20	28.9	+59.8	40.3	21	14.5	+59.9	40.6	22	0.00	+59.9	40.8	22	45.3	+60.0	41.1	23	30.4	+60.0	41.4	24	15.3	+60.0	41.7	25				
26	20	42.8	+59.8	40.0	21	28.7	+59.8	40.3	22	14.4	+59.9	40.5	23	28.9	+59.8	40.8	23	45.3	+59.9	41.1	24	30.4	+60.0	41.4	25	15.3	+60.0	42.0	26				
27	21	42.6	+59.8	39.9	22	28.5	+59.8	40.2	23	14.3	+59.9	40.5	24	29.8	+59.8	40.7	24	45.2	+60.0	41.0	25	30.4	+59.9	41.3	26	15.3	+60.0	42.0	27				
28	22	42.4	+59.7	39.8	23	28.4	+59.8	40.1	24	14.2	+59.8	40.4	25	29.8	+59.8	40.7	25	45.2	+59.9	41.0	26	30.3	+60.0	41.3	27	15.3	+60.0	42.0	28				
29	23	42.1	+59.8	39.7	24	28.2	+59.8	40.0	25	14.0	+59.9	40.3	26	29.7	+59.8	40.6	26	45.1	+60.0	40.9	27	30.3	+60.0	41.3	28	15.3	+60.0	42.0	29				
30	24	41.9	+59.8	39.6	25	28.0	+59.8	39.9	26	13.9	+59.9	40.2	27	29.6	+59.9	40.6	27	45.1	+59.9	40.9	28	30.3	+60.0	41.3	29	15.3	+60.0	41.6	30				
31	25	41.7	+59.7	39.5	26	27.8	+59.8	39.8	27	13.8	+59.9	40.2	28	29.5	+59.9	40.5	28	45.0	+60.0	40.9	29	30.3	+60.0	41.2	31	15.3	+60.0	42.0	31				
32	26	41.4	+59.8	39.4	27	27.6	+59.9	39.8	28	13.7	+59.8	40.1	29	29.4	+59.9	40.4	29	45.0	+59.9	40.8	30	30.3	+59.9	41.2	32	15.3	+60.0	42.0	32				
33	27	41.2	+59.7	39.3	28	27.5	+59.8	39.7	29	13.5	+59.9	40.0	30	29.3	+59.9	40.4	30	44.9	+60.0	40.8	31	30.2	+60.0	41.2	32	15.3	+60.0	42.0	33				
34	28	40.9	+59.7	39.2	29	27.3	+59.8	39.6	30	13.4	+59.8	39.9	31	29.3	+59.9	40.3	31	44.9	+59.9	40.7	32	30.2	+60.0	41.0	34	15.3	+59.9	41.6	34				
35	29	40.6	+59.8	39.1	30	27.1	+59.8	39.5	31	13.2	+59.9	39.9	32	29.2	+59.9	40.3	32	44.8	+60.0	40.7	33	30.2	+60.0	41.1	35	15.2	+60.0	41.5	35				
36	30	40.4	+59.7	39.0	31	26.9	+59.8	39.4	32	13.1	+59.9	40.2	33	29.1	+59.9	40.6	33	44.8	+59.9	41.0	34	30.2	+59.9	41.1	35	15.2	+60.0	41.5	36				
37	31	40.1	+59.7	38.9	32	26.7	+59.8	39.3	33	13.0	+59.8	39.7	34	29.0	+59.9	40.1	34	44.7	+60.0	40.6	35	30.1	+60.0	41.0	36	15.2	+60.0	41.5	37				
38	32	39.8	+59.7	38.8	33	26.5	+59.7	39.2	3																								

43°, 317° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z																						
0	5 06.8	+59.8	136.8	4 23.1	+59.8	136.8	3 39.3	+59.9	136.9	2 55.5	+59.9	136.9	2 11.6	+60.0	137.0	1 27.8	+59.9	137.0	0 43.9	+60.0	137.0	0 00.0	+60.0	137.0	0
1	6 06.6	+59.8	136.7	5 22.9	+59.9	136.8	4 39.2	+59.9	136.8	3 55.4	+59.9	136.9	3 11.6	+59.9	136.9	2 27.7	+60.0	137.0	1 43.9	+60.0	137.0	1 00.0	+60.0	137.0	1
2	7 06.4	+59.8	136.6	6 22.8	+59.8	136.7	5 39.1	+59.9	136.8	4 55.3	+60.0	136.8	4 11.5	+60.0	136.9	3 27.7	+60.0	136.9	2 43.9	+60.0	137.0	2 00.0	+60.0	137.0	2
3	8 06.2	+59.8	136.5	7 22.6	+59.8	136.6	6 39.0	+59.8	136.7	5 55.3	+59.9	136.8	5 11.5	+60.0	136.9	4 27.7	+60.0	136.9	3 43.9	+60.0	137.0	3 00.0	+60.0	137.0	3
4	9 06.0	+59.8	136.4	8 22.4	+59.9	136.6	7 38.8	+59.9	136.7	6 55.2	+59.9	136.7	6 11.5	+59.9	136.8	5 27.7	+60.0	136.9	4 43.9	+60.0	136.9	4 00.0	+60.0	137.0	4
5	10 05.8	+59.7	136.4	9 22.3	+59.8	136.5	8 38.7	+59.9	136.6	7 55.1	+59.9	136.7	7 11.4	+60.0	136.8	6 27.7	+60.0	136.9	5 43.9	+60.0	136.9	5 00.0	+60.0	137.0	5
6	11 05.5	+59.8	136.3	10 22.1	+59.9	136.4	9 38.6	+59.9	136.5	8 55.0	+60.0	136.6	8 11.4	+59.9	136.7	7 27.7	+59.9	136.8	6 43.9	+60.0	136.9	6 00.0	+60.0	137.0	6
7	12 05.3	+59.8	136.2	11 22.0	+59.8	136.3	10 38.5	+59.9	136.5	9 55.0	+59.9	136.6	9 11.3	+60.0	136.7	8 27.6	+60.0	136.8	7 43.9	+59.9	136.9	7 00.0	+60.0	137.0	7
8	13 05.1	+59.8	136.1	12 21.8	+59.9	136.3	11 38.4	+59.9	136.4	10 54.9	+59.9	136.5	10 11.3	+60.0	136.7	9 27.6	+60.0	136.8	8 43.8	+60.0	136.9	8 00.0	+60.0	137.0	8
9	14 04.9	+59.8	136.0	13 21.7	+59.8	136.2	12 38.3	+59.9	136.3	11 54.8	+60.0	136.5	11 11.3	+59.9	136.6	10 27.6	+60.0	136.8	9 43.8	+60.0	136.9	9 00.0	+60.0	137.0	9
10	15 04.7	+59.7	135.9	14 21.5	+59.8	136.1	13 38.2	+59.9	136.3	12 54.8	+59.9	136.4	12 11.2	+60.0	136.6	11 27.6	+60.0	136.7	10 43.8	+60.0	136.9	10 00.0	+60.0	137.0	10
11	16 04.4	+59.8	135.8	15 21.3	+59.9	136.0	14 38.1	+59.9	136.2	13 54.7	+59.9	136.4	13 11.2	+59.9	136.6	12 27.6	+59.9	136.7	11 43.8	+60.0	136.9	11 00.0	+60.0	137.0	11
12	17 04.2	+59.8	135.7	16 21.2	+59.8	136.0	15 38.0	+59.8	136.2	14 54.6	+59.9	136.3	14 11.1	+60.0	136.5	13 27.5	+60.0	136.7	12 43.8	+60.0	136.9	12 00.0	+60.0	137.0	12
13	18 04.0	+59.8	135.7	17 21.0	+59.8	135.9	16 37.8	+59.9	136.1	15 54.5	+60.0	136.3	15 11.1	+60.0	136.5	14 27.5	+60.0	136.7	13 43.8	+60.0	136.8	13 00.0	+60.0	137.0	13
14	19 03.8	+59.7	135.6	18 20.8	+59.9	135.8	17 37.7	+59.9	136.0	16 54.5	+59.9	136.2	16 11.1	+59.9	136.4	15 27.5	+60.0	136.6	14 43.8	+60.0	136.8	14 00.0	+60.0	137.0	14
15	20 03.5	+59.8	135.5	19 20.7	+59.8	135.7	18 37.6	+59.9	136.0	17 54.4	+59.9	136.2	17 11.0	+60.0	136.4	16 27.5	+60.0	136.6	15 43.8	+60.0	136.8	15 00.0	+60.0	137.0	15
16	21 03.3	+59.7	135.4	20 20.5	+59.8	135.6	19 37.5	+59.9	135.9	18 54.3	+59.9	136.1	18 10.9	+59.9	136.3	17 27.5	+60.0	136.6	16 43.8	+60.0	136.8	16 00.0	+60.0	137.0	16
17	22 03.0	+59.8	135.3	21 20.3	+59.8	135.6	20 37.4	+59.9	135.8	19 54.2	+60.0	136.1	19 10.9	+60.0	136.3	18 27.5	+59.9	136.6	17 43.8	+60.0	136.8	17 00.0	+60.0	137.0	17
18	23 02.8	+59.8	135.2	22 20.1	+59.9	135.5	21 37.3	+59.8	135.8	20 54.2	+59.9	136.0	20 10.9	+60.0	136.3	19 27.4	+60.0	136.5	18 43.8	+60.0	136.8	18 00.0	+60.0	137.0	18
19	24 02.6	+59.7	135.1	23 20.0	+59.8	135.4	22 37.1	+59.9	135.7	21 54.1	+59.9	136.0	21 10.9	+59.9	136.2	20 27.4	+60.0	136.5	19 43.8	+60.0	136.8	19 00.0	+60.0	137.0	19
20	25 02.3	+59.7	135.0	24 19.8	+59.8	135.3	23 37.0	+59.9	135.6	22 54.0	+59.9	135.9	22 10.8	+60.0	136.2	21 27.4	+60.0	136.5	20 43.8	+60.0	136.7	20 00.0	+60.0	137.0	20
21	26 02.0	+59.8	134.9	25 19.6	+59.8	135.2	24 36.9	+59.8	135.5	23 53.9	+59.9	135.9	23 10.8	+59.9	136.2	22 27.4	+60.0	136.5	21 43.8	+60.0	136.7	21 00.0	+60.0	137.0	21
22	27 01.8	+59.7	134.8	26 19.4	+59.8	135.1	25 36.7	+59.9	135.5	24 53.8	+60.0	135.8	24 10.7	+60.0	136.1	23 27.4	+59.9	136.4	22 43.8	+60.0	136.7	22 00.0	+60.0	137.0	22
23	28 01.5	+59.8	134.7	27 19.2	+59.8	135.0	26 36.6	+59.9	135.4	25 53.8	+59.9	135.7	25 10.7	+59.9	136.1	24 27.3	+60.0	136.4	23 43.8	+60.0	136.7	23 00.0	+60.0	137.0	23
24	29 01.3	+59.7	134.6	28 19.0	+59.8	134.9	27 36.5	+59.8	135.3	26 53.7	+59.9	135.7	26 10.6	+60.0	136.0	25 27.3	+60.0	136.4	24 43.8	+60.0	136.7	24 00.0	+60.0	137.0	24
25	30 01.0	+59.7	134.5	29 18.8	+59.8	134.9	28 36.3	+59.9	135.2	27 53.6	+59.9	135.6	27 10.6	+59.9	136.0	26 27.3	+60.0	136.3	25 43.8	+60.0	136.7	25 00.0	+60.0	137.0	25
26	31 00.7	+59.7	134.3	30 18.6	+59.8	134.8	29 36.2	+59.8	135.2	28 53.5	+59.9	135.6	28 10.5	+60.0	135.9	27 27.3	+60.0	136.3	26 43.8	+60.0	136.7	26 00.0	+60.0	137.0	26
27	32 00.4	+59.7	134.2	31 18.4	+59.8	134.7	30 36.1	+59.8	135.1	29 53.4	+59.9	135.5	29 10.5	+59.9	135.9	28 27.3	+59.9	136.3	27 43.8	+59.9	136.6	27 00.0	+60.0	137.0	27
28	33 00.1	+59.7	134.1	32 18.2	+59.8	134.6	31 35.9	+59.9	135.0	30 53.3	+59.9	135.4	30 10.4	+60.0	135.8	29 27.2	+60.0	136.2	28 43.7	+60.0	136.6	28 00.0	+60.0	137.0	28
29	33 59.8	+59.7	134.0	33 18.0	+59.8	134.5	32 35.8	+59.8	134.9	31 53.2	+59.9	135.4	31 10.4	+59.9	135.8	30 27.2	+60.0	136.2	29 43.7	+60.0	136.7	29 00.0	+60.0	137.0	29
30	34 59.5	+59.7	133.9	34 17.8	+59.7	134.4	33 35.6	+59.9	134.8	32 53.1	+59.9	135.3	32 10.3	+60.0	135.8	31 27.2	+60.0	136.2	30 43.7	+60.0	136.6	30 00.0	+60.0	137.0	30
31	35 59.2	+59.7	133.7	35 17.5	+59.8	134.3	34 35.5	+59.8	134.8	33 53.0	+59.9	135.2	33 10.3	+59.9	135.7	32 27.2	+59.9	136.1	31 43.7	+60.0	136.6	31 00.0	+60.0	137.0	31
32	36 58.9	+59.7	133.6	36 17.3	+59.8	134.1	35 35.3	+59.8	134.7	34 52.9	+59.9	135.2	34 10.2	+60.0	135.6	33 27.1	+60.0	136.1	32 43.7	+60.0	136.6	32 00.0	+60.0	137.0	32
33	37 58.6	+59.6	133.5	37 17.1	+59.7	134.0	36 35.1	+59.9	134.6	35 52.8	+59.9	135.1	35 10.2	+59.9	135.6	34 27.1	+60.0	136.1	33 43.7	+60.0	136.5	33 00.0	+60.0	137.0	33
34	38 58.2	+59.7	133.3	38 16.8	+59.8	133.9	37 35.0	+59.8	134.5	36 52.7	+59.9	135.0	36 10.1	+59.9	134.3	35 27.1	+60.0	136.3	34 43.6	+60.0	136.7	34 00.0	+60.0	137.0	34
35	39 57.9	+59.6	133.2	39 16.6	+59.7	133.8	38 34.8	+59.8	134.4	37 52.6	+59.9	134.9	37 10.0	+60.0	135.5	36 27.1	+59.9	136.0	35 43.7	+60.0	136.5	35 00.0	+60.0	137.0	35
36	40 57.5	+59.6	133.1	40 16.3	+59.7	133.7	39 34.6	+59.8	134.3	38 52.5	+59.9	134.9	38 10.0	+59.9	135.4	37 27.0	+60.0	136.0	36 43						

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 43°, 317°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z																			
0	5 06.8 -59.8	136.8		4 23.1 -59.9	136.8		3 39.3 -59.9	136.9		2 55.5 -60.0	136.9		2 11.6 -59.9	137.0		1 27.8 -60.0	137.0		0 43.9 -60.0	137.0		0 00.0 +60.0	43.0		0
1	4 07.0 -59.8	136.9		3 23.2 -59.8	136.9		2 39.4 -59.9	137.0		1 55.5 -59.9	137.0		1 11.7 -60.0	137.0		0 27.8 -60.0	137.0		0 16.1 +60.0	43.0		1 00.0 +60.0	43.0		1
2	3 07.2 -59.8	137.0		2 23.4 -59.9	137.0		1 39.5 -59.9	137.0		0 55.6 -59.9	137.0		0 11.7 -60.0	137.0		0 32.2 +60.0	43.0		1 16.1 +60.0	43.0		2 00.0 +60.0	43.0		2
3	2 07.4 -59.8	137.0		1 23.5 -59.8	137.1		0 39.6 -59.9	137.1		0 04.3 +60.0	42.9		0 48.3 +59.9	42.9		2 32.2 +60.0	42.9		2 16.1 +60.0	43.0		3 00.0 +60.0	43.0		3
4	1 07.6 -59.7	137.1		0 23.7 -59.9	137.1		0 20.3 +59.9	42.9		1 04.3 +59.9	42.9		1 48.2 +60.0	42.9		2 32.2 +60.0	42.9		3 16.1 +60.0	43.0		4 00.0 +60.0	43.0		4
5	0 07.9 -59.8	137.2		0 36.2 +59.8	42.8		1 20.2 +59.9	42.8		2 04.2 +59.9	42.8		2 48.2 +60.0	42.9		3 32.2 +59.9	42.9		4 16.1 +60.0	42.9		5 00.0 +60.0	43.0		5
6	0 51.9 +59.8	42.7		1 36.0 +59.9	42.7		2 20.1 +59.9	42.8		3 04.1 +60.0	42.8		3 48.2 +59.9	42.8		4 32.1 +60.0	42.9		5 16.1 +60.0	42.9		6 00.0 +60.0	43.0		6
7	1 51.7 +59.8	42.6		2 35.9 +59.8	42.7		3 20.0 +59.9	42.7		4 04.1 +59.9	42.7		4 48.1 +60.0	42.8		5 32.1 +60.0	42.9		6 16.1 +60.0	42.9		7 00.0 +60.0	43.0		7
8	2 51.5 +59.8	42.5		3 35.7 +59.9	42.6		4 19.9 +59.9	42.6		5 04.0 +59.9	42.7		5 48.1 +59.9	42.8		6 32.1 +60.0	42.8		7 16.1 +60.0	42.9		8 00.0 +60.0	43.0		8
9	3 51.3 +59.8	42.5		4 35.6 +59.8	42.5		5 19.8 +59.9	42.6		6 03.9 +60.0	42.6		6 48.0 +60.0	42.7		7 32.1 +60.0	42.8		8 16.1 +60.0	42.9		9 00.0 +60.0	43.0		9
10	4 51.1 +59.8	42.4		5 35.4 +59.9	42.4		6 19.7 +59.9	42.5		7 03.9 +59.9	42.6		7 48.0 +60.0	42.7		8 32.1 +60.0	42.8		9 16.1 +60.0	42.9		10 00.0 +60.0	43.0		10
11	5 50.9 +59.8	42.3		6 35.3 +59.8	42.4		7 19.6 +59.8	42.5		8 03.8 +59.9	42.5		8 48.0 +59.9	42.6		9 32.1 +59.9	42.8		10 16.1 +60.0	42.9		11 00.0 +60.0	43.0		11
12	6 50.7 +59.8	42.2		7 35.1 +59.8	42.3		8 19.4 +59.9	42.4		9 03.7 +60.0	42.5		9 47.9 +60.0	42.6		10 32.0 +60.0	42.7		11 16.1 +60.0	42.9		12 00.0 +60.0	43.0		12
13	7 50.5 +59.8	42.1		8 34.9 +59.9	42.2		9 19.3 +59.9	42.3		10 03.7 +59.9	42.4		10 47.9 +59.9	42.6		11 32.0 +60.0	42.7		12 16.1 +60.0	42.8		13 00.0 +60.0	43.0		13
14	8 50.3 +59.8	42.0		9 34.8 +59.8	42.2		10 19.2 +59.9	42.3		11 03.6 +59.9	42.4		11 47.8 +60.0	42.5		12 32.0 +60.0	42.7		13 16.1 +60.0	42.8		14 00.0 +60.0	43.0		14
15	9 50.1 +59.7	42.0		10 34.6 +59.9	42.1		11 19.1 +59.9	42.2		12 03.5 +59.9	42.3		12 47.8 +60.0	42.5		13 32.0 +60.0	42.7		14 16.1 +60.0	42.8		15 00.0 +60.0	43.0		15
16	10 49.8 +59.8	41.9		11 34.5 +59.8	42.0		12 19.0 +59.9	42.1		13 03.4 +60.0	42.3		13 47.8 +59.9	42.5		14 32.0 +60.0	42.6		15 16.1 +59.9	42.8		16 00.0 +60.0	43.0		16
17	11 49.6 +59.8	41.8		12 34.3 +59.8	41.9		13 18.9 +59.9	42.1		14 03.4 +59.9	42.2		14 47.7 +60.0	42.4		15 32.0 +59.9	42.6		16 16.0 +60.0	42.8		17 00.0 +60.0	43.0		17
18	12 49.4 +59.8	41.7		13 34.1 +59.9	41.9		14 18.8 +59.9	42.0		15 03.3 +59.9	42.2		15 47.7 +59.9	42.4		16 31.9 +60.0	42.6		17 16.0 +60.0	42.8		18 00.0 +60.0	43.0		18
19	13 49.2 +59.8	41.6		14 34.0 +59.8	41.8		15 18.7 +59.9	42.0		16 03.2 +59.9	42.1		16 47.6 +60.0	42.3		17 31.9 +60.0	42.6		18 16.0 +60.0	42.8		19 00.0 +60.0	43.0		19
20	14 49.0 +59.7	41.5		15 33.8 +59.9	41.7		16 18.6 +59.8	41.9		17 03.1 +60.0	42.1		17 47.6 +60.0	42.3		18 31.9 +60.0	42.5		19 16.0 +60.0	42.8		20 00.0 +60.0	43.0		20
21	15 48.7 +59.8	41.4		16 33.7 +59.8	41.6		17 18.4 +59.9	41.8		18 03.1 +59.9	42.0		18 47.6 +59.9	42.3		19 31.9 +60.0	42.5		20 16.0 +60.0	42.7		21 00.0 +60.0	43.0		21
22	16 48.5 +59.8	41.3		17 33.5 +59.8	41.5		18 18.3 +59.9	41.8		19 03.0 +59.9	42.0		19 47.5 +60.0	42.2		20 31.9 +59.9	42.5		21 16.0 +60.0	42.7		22 00.0 +60.0	43.0		22
23	17 48.3 +59.8	41.3		18 33.3 +59.8	41.5		19 18.2 +59.9	41.7		20 02.9 +59.9	41.9		20 47.5 +59.9	42.2		21 31.8 +60.0	42.4		22 16.0 +60.0	42.7		23 00.0 +60.0	43.0		23
24	18 48.1 +59.7	41.2		19 33.1 +59.9	41.4		20 18.1 +59.9	41.6		21 02.8 +60.0	41.9		21 47.4 +60.0	42.1		22 31.8 +60.0	42.4		23 16.0 +60.0	42.7		24 00.0 +60.0	43.0		24
25	19 47.8 +59.8	41.1		20 33.0 +59.8	41.3		21 18.0 +59.8	41.6		22 02.8 +59.9	41.8		22 47.4 +59.9	42.1		23 31.8 +60.0	42.4		24 16.0 +60.0	42.7		25 00.0 +60.0	43.0		25
26	20 47.6 +59.7	41.0		21 32.8 +59.8	41.2		22 17.8 +59.9	41.5		23 02.7 +59.9	41.8		23 47.3 +60.0	42.1		24 31.8 +60.0	42.4		25 16.0 +60.0	42.7		26 00.0 +60.0	43.0		26
27	21 47.3 +59.8	40.9		22 32.6 +59.8	41.1		23 17.7 +59.9	41.4		24 02.6 +59.9	41.7		24 47.3 +59.9	42.0		25 31.8 +59.9	42.3		26 16.0 +60.0	42.7		27 00.0 +60.0	43.0		27
28	22 47.1 +59.8	40.8		23 32.4 +59.8	41.1		24 17.6 +59.9	41.4		25 02.5 +59.9	41.7		25 47.2 +60.0	42.0		26 31.7 +60.0	42.3		27 16.0 +60.0	42.6		28 00.0 +60.0	43.0		28
29	23 46.9 +59.7	40.7		24 32.3 +59.8	41.0		25 17.5 +59.8	41.3		26 02.4 +60.0	41.6		26 47.2 +59.9	41.9		27 31.7 +60.0	42.3		28 16.0 +60.0	42.6		29 00.0 +60.0	43.0		29
30	24 46.6 +59.8	40.6		25 32.1 +59.8	40.9		26 17.3 +59.9	41.2		27 02.4 +59.9	41.5		27 47.1 +60.0	41.9		28 31.7 +60.0	42.2		29 16.0 +60.0	42.6		30 00.0 +60.0	43.0		30
31	25 46.4 +59.7	40.5		26 31.9 +59.8	40.8		27 17.2 +59.9	41.1		28 02.3 +59.9	41.5		28 47.1 +59.9	41.8		29 31.7 +59.9	42.2		30 16.0 +60.0	42.6		31 00.0 +60.0	43.0		31
32	26 46.1 +59.7	40.4		27 31.7 +59.8	40.7		28 17.1 +59.8	41.1		29 02.2 +59.9	41.4		29 47.0 +60.0	41.8		30 31.6 +60.0	42.2		31 16.0 +60.0	42.6		32 00.0 +60.0	43.0		32
33	27 45.8 +59.8	40.3		28 31.5 +59.8	40.6		29 16.9 +59.9	41.0		30 02.1 +59.9	41.4		30 47.0 +59.9	41.7		31 31.6 +60.0	42.1		32 16.0 +60.0	42.6		33 00.0 +60.0	43.0		33
34	28 45.6 +59.7	40.2		29 31.3 +59.8	40.5		30 16.8 +59.8	40.9		31 02.0 +59.9	41.3		31 46.9 +60.0	41.7		32 31.6 +60.0	42.5		33 16.0 +60.0	42.0		34 00.0 +60.0	43.0		34
35	29 45.3 +59.7	40.1		30 31.1 +59.8	40.4		31 16.6 +59.9	40.8		32 01.9 +59.9	41.2		32 46.9 +59.9	41.6		33 31.6 +60.0	42.1		34 16.0 +59.9	42.5		35 00.0 +60.0	43.0		35
36	30 45.0 +59.7	39.9		31 30.9 +59.8	40.3		32 16.5 +59.8	40.7		33 01.8 +59.9	41.2		33 46.8 +60.0	41.6		34 31.6 +59.9	42.0		35 15.9 +60.0	42.5		36 00.0 +60.0	43.0		36
37	31 44.7 +59.7	39.8		32 30.7 +59.8	40.2		33 16.3 +59.9	40.7		34 01.7 +59.9	41.1		34 46.8 +59.9	41.5		35 31.5 +60.0	42.0		36 15.9 +60.0	42.5		37 00.0 +60.0	43.0		37
38	32 44.4 +59.7	39.7		33 30.																					

44°, 316° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	Dec.
0	5	01.8	+59.7	135.8	4	18.7	+59.9	135.8	3	35.7	+59.9	135.9	2	52.6	+59.9	135.9	1	26.3	+60.0	136.0	0	43.2	+60.0	136.0	0
1	6	01.5	+59.8	135.7	5	18.6	+59.8	135.8	4	35.6	+59.8	135.8	3	52.5	+59.9	135.9	2	26.3	+60.0	136.0	1	43.2	+60.0	136.0	1
2	7	01.3	+59.8	135.6	6	18.4	+59.9	135.7	5	35.4	+59.9	135.8	4	52.4	+60.0	135.8	3	26.3	+60.0	135.9	2	43.2	+59.9	136.0	2
3	8	01.1	+59.8	135.5	7	18.3	+59.8	135.6	6	35.3	+59.9	135.7	5	52.4	+59.9	135.8	4	26.3	+59.9	135.9	3	43.1	+60.0	136.0	3
4	9	00.9	+59.8	135.4	8	18.1	+59.8	135.5	7	35.2	+59.9	135.6	6	52.3	+59.9	135.7	6	26.3	+60.0	135.9	4	43.1	+60.0	136.0	4
5	10	00.7	+59.7	135.4	9	17.9	+59.9	135.5	8	35.1	+59.9	135.6	7	52.2	+59.9	135.7	7	26.3	+59.9	135.8	6	26.2	+60.0	135.9	5
6	11	00.4	+59.8	135.3	10	17.8	+59.8	135.4	9	35.0	+59.9	135.5	8	52.1	+60.0	135.6	8	26.2	+60.0	135.8	6	43.1	+60.0	135.9	6
7	12	00.2	+59.8	135.2	11	17.6	+59.8	135.3	10	34.9	+59.9	135.5	9	52.1	+59.9	135.6	9	26.2	+60.0	135.8	7	43.1	+60.0	136.0	7
8	13	00.0	+59.8	135.1	12	17.4	+59.9	135.2	11	34.8	+59.9	135.4	10	52.0	+59.9	135.5	10	26.1	+60.0	135.7	8	43.1	+60.0	135.9	8
9	13	59.8	+59.7	135.0	13	17.3	+59.8	135.2	12	34.7	+59.8	135.3	11	51.9	+60.0	135.5	11	26.2	+59.9	135.8	9	43.1	+60.0	136.0	9
10	14	59.5	+59.8	134.9	14	17.1	+59.8	135.1	13	34.5	+59.9	135.3	12	51.9	+59.9	135.4	12	26.0	+60.0	135.6	11	26.1	+60.0	135.7	10
11	15	59.3	+59.8	134.8	15	16.9	+59.9	135.0	14	34.4	+59.9	135.2	13	51.8	+59.9	135.4	13	26.0	+60.0	135.6	12	43.1	+60.0	135.9	11
12	16	59.1	+59.7	134.7	16	16.8	+59.8	134.9	15	34.3	+59.9	135.1	14	51.7	+59.9	135.3	14	26.0	+60.0	135.7	12	43.1	+60.0	135.8	12
13	17	58.8	+59.8	134.6	17	16.6	+59.8	134.9	16	34.2	+59.9	135.1	15	51.6	+60.0	135.3	15	26.0	+60.0	135.5	13	43.1	+60.0	136.0	13
14	18	58.6	+59.7	134.5	18	16.4	+59.8	134.8	17	34.1	+59.8	135.0	16	51.6	+59.9	135.2	16	26.0	+59.9	135.4	14	43.1	+60.0	136.0	14
15	19	58.3	+59.8	134.4	19	16.2	+59.9	134.7	18	33.9	+59.9	134.9	17	51.5	+59.9	135.2	17	26.0	+60.0	135.6	15	43.1	+60.0	135.8	15
16	20	58.1	+59.8	134.3	20	16.1	+59.8	134.6	19	33.8	+59.9	134.9	18	51.4	+59.9	135.1	18	26.0	+60.0	135.6	16	43.1	+60.0	135.8	16
17	21	57.9	+59.7	134.3	21	15.9	+59.8	134.5	20	33.7	+59.9	134.8	19	51.3	+59.9	135.1	19	26.0	+60.0	135.5	17	43.1	+60.0	135.8	17
18	22	57.6	+59.7	134.2	22	15.7	+59.8	134.4	21	33.6	+59.8	134.7	20	51.2	+60.0	135.0	20	26.0	+60.0	135.5	18	43.1	+60.0	136.0	18
19	23	57.3	+59.8	134.1	23	15.5	+59.8	134.4	22	33.4	+59.9	134.7	21	51.2	+59.9	135.0	21	26.0	+59.9	135.2	19	43.1	+60.0	136.0	19
20	24	57.1	+59.7	133.9	24	15.3	+59.8	134.3	23	33.3	+59.9	134.6	22	51.1	+59.9	134.9	22	26.0	+60.0	135.2	20	43.1	+60.0	135.7	20
21	25	56.8	+59.8	133.8	25	15.1	+59.8	134.2	24	33.2	+59.8	134.5	23	51.0	+59.9	134.8	23	26.0	+60.0	135.4	21	43.1	+60.0	135.7	21
22	26	56.6	+59.7	133.7	26	14.9	+59.8	134.1	25	33.0	+59.8	134.4	24	50.9	+59.9	134.8	24	26.0	+60.0	135.1	22	43.1	+60.0	135.7	22
23	27	56.3	+59.7	133.6	27	14.7	+59.8	134.0	26	32.9	+59.9	134.4	25	50.8	+59.9	134.7	25	26.0	+60.0	135.4	23	43.1	+59.9	135.7	23
24	28	56.0	+59.7	133.5	28	14.5	+59.8	133.9	27	32.8	+59.8	134.3	26	50.7	+59.9	134.7	26	26.0	+60.0	135.0	24	43.0	+60.0	136.0	24
25	29	55.7	+59.7	133.4	29	14.3	+59.8	133.8	28	32.6	+59.9	134.2	27	50.6	+59.9	134.6	27	26.0	+60.0	135.3	25	43.0	+60.0	136.0	25
26	30	55.4	+59.7	133.3	30	14.1	+59.8	133.7	29	32.5	+59.8	134.1	28	50.5	+60.0	134.5	28	26.0	+60.0	135.3	26	43.0	+60.0	136.0	26
27	31	55.1	+59.7	133.2	31	13.9	+59.8	133.6	30	32.3	+59.9	134.1	29	50.5	+59.9	134.5	29	26.0	+60.0	135.2	27	43.0	+60.0	135.6	27
28	32	54.8	+59.7	133.1	32	13.7	+59.8	133.5	31	32.2	+59.8	134.0	30	50.4	+59.9	134.4	30	26.0	+60.0	134.8	28	43.0	+60.0	136.0	28
29	33	54.5	+59.7	132.9	33	13.5	+59.7	133.4	32	32.0	+59.9	133.9	31	50.3	+59.9	134.3	31	26.0	+59.9	135.2	29	43.0	+60.0	135.6	29
30	34	54.2	+59.7	132.8	34	13.2	+59.8	133.3	33	31.9	+59.8	133.8	32	50.2	+59.9	134.3	32	26.0	+60.0	135.2	30	43.0	+60.0	135.6	30
31	35	53.9	+59.6	132.7	35	13.0	+59.8	133.2	34	31.7	+59.9	133.7	33	50.1	+59.9	134.2	33	26.0	+60.0	135.1	31	43.0	+60.0	135.6	31
32	36	53.5	+59.7	132.6	36	12.8	+59.7	133.1	35	31.6	+59.8	133.6	34	50.0	+59.9	134.1	33	25.7	+59.9	135.1	32	43.0	+60.0	135.6	32
33	37	53.2	+59.7	132.4	37	12.5	+59.8	133.0	36	31.4	+59.8	133.5	35	49.9	+59.8	134.1	35	25.9	+60.0	135.1	33	43.0	+60.0	135.5	33
34	38	52.9	+59.6	132.3	38	12.3	+59.7	132.9	37	31.2	+59.8	133.4	36	49.7	+59.9	134.0	36	25.9	+60.0	135.0	34	43.0	+60.0	136.0	34
35	39	52.5	+59.6	132.1	39	12.0	+59.7	132.8	38	31.0	+59.9	133.3	37	49.6	+59.9	133.9	37	25.8	+60.0	135.4	35	43.0	+60.0	136.0	35
36	40	52.1	+59.6	132.0	40	11.7	+59.7	132.6	39	30.9	+59.8	133.2	38	49.5	+59.9	133.8	38	25.6	+60.0	135.3	36	43.0	+60.0	136.0	36
37	41	51.7	+59.6	131.8	41	11.4	+59.8	132.5	40	30.7	+59.8	133.1	39	49.4	+59.9	133.8	39	25.7	+60.0	135.2	37	43.0	+60.0	136.0	37
38	42	51.3	+59.6	131.7	42	11.2	+59.7	132.4	41	30.5	+59.8	133.0	40	49.3	+59.9	133.7	40	25.6	+60.0	135.1	38	43.0	+60.0	136.0	38
39	43	50.9	+59.6	131.5	43	10.9	+59.7	132.2	42	30.3	+59.8	132.9	41	49.2	+59.8	133.6	41	25.5	+60.0	135.0	39	43.0	+60.0	136.0	39
40	44	50.5	+59.6	131.4	44	10.6	+59.7	132.1	43	30.1	+59.8	132.8	42	49.0	+59.9	133.5	42	25.5	+60.0	135.2	40	42.9	+60.0	135.6	40
41	45	50.1	+59.5	131.2	45	10.3	+59.6	132.0	44	29.9	+59.7	132.7	43	48.9	+59.9	134.3	43	25.4	+60.0	135.1	41	42.9	+60.0	135.6	41
42	46	49.6	+59.6	131.0	46	9.9	+59.7	131.8	45	29.6	+59.8	132.6	44	48.8	+59.8	133.3	44	25.3	+60.0	135.0	42	42.9	+60.0	135.6	

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 44° , 316°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.			
	Hc	d	Z	Hc	d	Z																						
0	5 01.8	-59.8	135.8	4 18.7	-59.8	135.8	3 35.7	-59.9	135.9	2 52.6	-60.0	135.9	2 09.5	-60.0	136.0	1 26.3	-60.0	136.0	0 43.2	-60.0	136.0	0 00.0	+60.0	44.0	0			
1	4 02.0	-59.8	135.9	3 18.9	-59.8	135.9	2 35.8	-59.9	136.0	1 52.6	-59.9	136.0	1 09.5	-60.0	136.0	0 26.3	-60.0	136.0	0 16.8	+60.0	44.0	1 00.0	+60.0	44.0	1			
2	3 02.2	-59.8	136.0	2 19.1	-59.9	136.0	1 35.9	-59.9	136.0	0 36.0	-59.9	136.1	0 09.5	-59.9	136.0	0 33.7	+59.9	44.0	1 16.8	+60.0	44.0	2 00.0	+60.0	44.0	2			
3	2 02.4	-59.8	136.0	1 19.2	-59.8	136.1	0 36.0	-59.9	136.1	0 23.9	+59.9	43.9	0 07.2	+59.9	43.9	0 50.4	+60.0	43.9	1 33.6	+60.0	43.9	2 16.8	+60.0	44.0	3 00.0	+60.0	44.0	3
4	1 02.6	-59.8	136.1	0 19.4	-59.9	136.1	0 23.9	+59.9	43.9	1 07.1	+60.0	43.9	1 50.4	+59.9	43.9	2 33.6	+60.0	43.9	3 16.8	+60.0	44.0	4 00.0	+60.0	44.0	4			
5	0 02.8	-59.7	136.2	0 40.5	+59.8	43.8	1 23.8	+59.9	43.8	2 07.1	+59.9	43.8	2 50.3	+60.0	43.9	3 33.6	+60.0	43.9	4 16.8	+60.0	43.9	5 00.0	+60.0	44.0	5			
6	0 56.9	+59.8	43.7	1 40.3	+59.9	43.7	2 23.7	+59.9	43.7	3 07.0	+59.9	43.8	3 50.3	+60.0	43.8	4 33.6	+60.0	43.9	5 16.8	+60.0	43.9	6 00.0	+60.0	44.0	6			
7	1 56.7	+59.8	43.6	2 40.2	+59.8	43.6	3 23.6	+59.8	43.7	4 06.9	+60.0	43.7	4 50.3	+59.9	43.8	5 33.6	+59.9	43.8	6 16.8	+60.0	43.9	7 00.0	+60.0	44.0	7			
8	2 56.5	+59.8	43.5	3 40.0	+59.8	43.6	4 23.4	+59.9	43.6	5 06.9	+59.9	43.7	5 50.2	+60.0	43.7	6 33.5	+60.0	43.8	7 16.8	+60.0	43.9	8 00.0	+60.0	44.0	8			
9	3 56.3	+59.8	43.5	4 39.8	+59.9	43.5	5 23.3	+59.9	43.6	6 06.8	+59.9	43.6	6 50.2	+59.9	43.7	7 33.5	+60.0	43.8	8 16.8	+60.0	43.9	9 00.0	+60.0	44.0	9			
10	4 56.1	+59.8	43.4	5 39.7	+59.8	43.4	6 23.2	+59.9	43.5	7 06.7	+59.9	43.6	7 50.1	+60.0	43.7	8 33.5	+60.0	43.8	9 16.8	+60.0	43.9	10 00.0	+60.0	44.0	10			
11	5 55.9	+59.7	43.3	6 39.5	+59.9	43.4	7 23.1	+59.9	43.4	8 06.6	+60.0	43.5	8 50.1	+60.0	43.6	9 33.5	+60.0	43.7	10 16.8	+60.0	43.9	11 00.0	+60.0	44.0	11			
12	6 55.6	+59.8	43.2	7 39.4	+59.8	43.3	8 23.0	+59.9	43.4	9 06.6	+59.9	43.5	9 50.1	+59.9	43.6	10 33.5	+60.0	43.7	11 16.8	+60.0	43.9	12 00.0	+60.0	44.0	12			
13	7 55.4	+59.8	43.1	8 39.2	+59.8	43.2	9 22.9	+59.9	43.3	10 06.5	+59.9	43.4	10 50.0	+60.0	43.6	11 33.5	+59.9	43.7	12 16.8	+60.0	43.8	13 00.0	+60.0	44.0	13			
14	8 55.2	+59.8	43.0	9 39.0	+59.9	43.1	10 22.8	+59.9	43.3	11 06.4	+60.0	43.4	11 50.0	+59.9	43.5	12 33.4	+60.0	43.7	13 16.8	+60.0	43.8	14 00.0	+60.0	44.0	14			
15	9 55.0	+59.8	42.9	10 38.9	+59.8	43.1	11 22.7	+59.8	43.2	12 06.4	+59.9	43.3	12 49.9	+60.0	43.5	13 33.4	+60.0	43.6	14 16.8	+60.0	43.8	15 00.0	+60.0	44.0	15			
16	10 54.8	+59.7	42.8	11 38.7	+59.8	43.0	12 22.5	+59.9	43.1	13 06.3	+59.9	43.3	13 49.9	+60.0	43.4	14 33.4	+60.0	43.6	15 16.8	+60.0	43.8	16 00.0	+60.0	44.0	16			
17	11 54.5	+59.8	42.8	12 38.5	+59.9	42.9	13 22.4	+59.9	43.1	14 06.2	+59.9	43.2	14 49.9	+59.9	43.4	15 33.4	+60.0	43.6	16 16.8	+60.0	43.8	17 00.0	+60.0	44.0	17			
18	12 54.3	+59.8	42.7	13 38.4	+59.8	42.8	14 22.3	+59.9	43.0	15 06.1	+60.0	43.2	15 49.8	+60.0	43.4	16 33.4	+59.9	43.6	17 16.8	+60.0	43.8	18 00.0	+60.0	44.0	18			
19	13 54.1	+59.8	42.6	14 38.2	+59.8	42.8	15 22.2	+59.9	42.9	16 06.1	+59.9	43.1	16 49.8	+59.9	43.3	17 33.3	+60.0	43.5	18 16.8	+59.9	43.8	19 00.0	+60.0	44.0	19			
20	14 53.9	+59.7	42.5	15 38.0	+59.9	42.7	16 22.1	+59.9	42.9	17 06.0	+59.9	43.1	17 49.7	+60.0	43.3	18 33.3	+60.0	43.5	19 16.7	+60.0	43.8	20 00.0	+60.0	44.0	20			
21	15 53.6	+59.8	42.4	16 37.9	+59.8	42.6	17 22.0	+59.8	42.8	18 05.9	+59.9	43.0	18 49.7	+59.9	43.2	19 33.3	+60.0	43.5	20 16.7	+60.0	43.7	21 00.0	+60.0	44.0	21			
22	16 53.4	+59.8	42.3	17 37.7	+59.8	42.5	18 21.8	+59.9	42.7	19 05.8	+59.9	43.0	19 49.6	+60.0	43.2	20 33.3	+60.0	43.5	21 16.7	+60.0	43.7	22 00.0	+60.0	44.0	22			
23	17 53.2	+59.7	42.2	18 37.5	+59.8	42.4	19 21.7	+59.9	42.7	20 05.7	+60.0	42.9	20 49.6	+60.0	43.2	21 33.3	+59.9	43.4	22 16.7	+60.0	43.7	23 00.0	+60.0	44.0	23			
24	18 52.9	+59.8	42.1	19 37.3	+59.9	42.4	20 21.6	+59.9	42.6	21 05.7	+59.9	42.9	21 49.6	+59.9	43.1	22 33.2	+60.0	43.4	23 16.7	+60.0	43.7	24 00.0	+60.0	44.0	24			
25	19 52.7	+59.7	42.0	20 37.2	+59.8	42.3	21 21.5	+59.8	42.5	22 05.6	+59.9	42.8	22 49.5	+60.0	43.1	23 33.2	+60.0	43.4	24 16.7	+60.0	43.7	25 00.0	+60.0	44.0	25			
26	20 52.4	+59.8	41.9	21 37.0	+59.8	42.2	22 21.3	+59.9	42.5	23 05.5	+59.9	42.7	23 49.5	+59.9	43.0	24 33.2	+60.0	43.3	25 16.7	+60.0	43.7	26 00.0	+60.0	44.0	26			
27	21 52.2	+59.7	41.8	22 36.8	+59.8	42.1	23 21.2	+59.9	42.4	24 05.4	+59.9	42.7	24 49.4	+60.0	43.0	25 33.2	+60.0	43.3	26 16.7	+60.0	43.7	27 00.0	+60.0	44.0	27			
28	22 51.9	+59.8	41.7	23 36.6	+59.8	42.0	24 21.1	+59.8	42.3	25 05.3	+59.9	42.6	25 49.4	+59.9	43.0	26 33.2	+59.9	43.3	27 16.7	+60.0	43.6	28 00.0	+60.0	44.0	28			
29	23 51.7	+59.7	41.6	24 36.4	+59.8	41.9	25 20.9	+59.9	42.2	26 05.2	+60.0	42.6	26 49.3	+60.0	42.9	27 33.1	+60.0	43.3	28 16.7	+60.0	43.6	29 00.0	+60.0	44.0	29			
30	24 51.4	+59.7	41.5	25 36.2	+59.8	41.8	26 20.8	+59.9	42.2	27 05.2	+59.9	42.5	27 49.3	+59.9	42.9	28 33.1	+60.0	43.2	29 16.7	+60.0	43.6	30 00.0	+60.0	44.0	30			
31	25 51.1	+59.8	41.4	26 36.0	+59.8	41.8	27 20.7	+59.8	42.1	28 05.1	+59.9	42.4	28 49.2	+60.0	42.8	29 33.1	+60.0	43.2	30 16.7	+60.0	43.6	31 00.0	+60.0	44.0	31			
32	26 50.9	+59.7	41.3	27 35.8	+59.8	41.7	28 20.5	+59.9	42.0	29 05.0	+59.9	42.4	29 49.2	+59.9	42.8	30 33.0	+59.9	43.2	31 16.7	+60.0	43.6	32 00.0	+60.0	44.0	32			
33	27 50.6	+59.7	41.2	28 35.6	+59.8	41.6	29 20.4	+59.8	42.3	30 04.9	+59.9	42.3	30 49.1	+60.0	42.7	31 33.0	+60.0	43.1	32 16.7	+60.0	43.6	33 00.0	+60.0	44.0	33			
34	28 50.3	+59.7	41.1	29 35.4	+59.8	41.5	30 20.2	+59.9	42.3	31 04.8	+59.9	42.3	31 49.1	+60.0	42.7	32 33.0	+60.0	43.1	33 16.7	+60.0	43.5	34 00.0	+60.0	44.0	34			
35	29 50.0	+59.8	41.0	30 35.2	+59.8	41.4	31 20.1	+59.8	41.8	32 04.7	+59.9	42.2	32 49.0	+59.9	42.6	33 33.0	+60.0	43.1	34 16.7	+60.0	43.5	35 00.0	+60.0	44.0	35			
36	30 49.8	+59.7	40.9	31 35.0	+59.8	41.3	32 19.9	+59.9	41.7	33 04.6	+59.9	42.1	33 48.9	+60.0	42.6	34 33.0	+59.9	43.0	35 16.7	+60.0	43.5	36 00.0	+60.0	44.0	36			
37	31 49.5	+59.7	40.8	32 34.8	+59.7	41.2	33 19.8	+59.8	41.6	34 04.5	+59.9	42.0	34 48.9	+59.9	42.5	35 32.9	+60.0	43.0	36 16.7	+59.9	43.5	37 00.0	+60.0	44.0				

45°, 315° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z					
0	4	56.6	+59.8	134.8	4	14.3	+59.9	134.8	3	32.0	+59.9	134.9	2	49.6	+60.0	134.9	2	07.3	+59.9	135.0	1	24.8	+60.0	135.0	0	00.0	+60.0	135.0	0
1	5	56.4	+59.8	134.7	5	14.2	+59.8	134.8	4	31.9	+59.9	134.8	3	49.6	+59.9	134.9	3	07.2	+60.0	134.9	2	24.8	+60.0	135.0	1	42.4	+60.0	135.0	1
2	6	56.2	+59.7	134.6	6	14.0	+59.8	134.7	5	31.8	+59.9	134.8	4	49.5	+59.9	134.8	4	07.2	+59.9	134.9	3	24.8	+60.0	134.9	2	42.4	+60.0	135.0	2
3	7	55.9	+59.8	134.5	7	13.8	+59.9	134.6	6	31.7	+59.8	134.7	5	49.4	+59.9	134.8	5	07.1	+60.0	134.8	4	24.8	+60.0	134.9	3	42.4	+60.0	135.0	3
4	8	55.7	+59.8	134.4	8	13.7	+59.8	134.5	7	31.5	+59.9	134.6	6	49.3	+60.0	134.7	6	07.1	+59.9	134.8	5	24.8	+60.0	134.9	4	42.4	+60.0	135.0	4
5	9	55.5	+59.7	134.3	9	13.5	+59.8	134.5	8	31.4	+59.9	134.6	7	49.3	+59.9	134.7	7	07.0	+60.0	134.8	6	24.8	+59.9	134.9	5	42.4	+60.0	134.9	5
6	10	55.2	+59.8	134.3	10	13.3	+59.9	134.4	9	31.3	+59.9	134.5	8	49.2	+59.9	134.6	8	07.0	+60.0	134.7	7	24.7	+60.0	134.8	6	42.4	+60.0	135.0	6
7	11	55.0	+59.8	134.2	11	13.2	+59.8	134.3	10	31.2	+59.9	134.5	9	49.1	+59.9	134.6	9	07.0	+59.9	134.7	8	24.7	+60.0	134.8	7	42.4	+60.0	135.0	7
8	12	54.8	+59.7	134.1	12	13.0	+59.8	134.2	11	31.1	+59.8	134.4	10	49.0	+60.0	134.5	10	06.9	+60.0	134.7	9	24.7	+60.0	134.8	8	42.4	+60.0	135.0	8
9	13	54.5	+59.8	134.0	13	12.8	+59.8	134.2	12	30.9	+59.9	134.3	11	49.0	+59.9	134.5	11	06.9	+59.9	134.6	10	24.7	+60.0	134.8	9	42.4	+60.0	135.0	9
10	14	54.3	+59.8	133.9	14	12.6	+59.9	134.1	13	30.8	+59.9	134.3	12	48.9	+59.9	134.4	12	06.8	+60.0	134.6	11	24.7	+59.9	134.7	10	42.4	+60.0	134.9	10
11	15	54.1	+59.7	133.8	15	12.5	+59.8	134.0	14	30.7	+59.9	134.2	13	48.8	+59.9	134.4	13	06.8	+59.9	134.5	12	24.6	+60.0	134.7	11	42.4	+60.0	134.9	11
12	16	53.8	+59.8	133.7	16	12.3	+59.8	133.9	15	30.6	+59.9	134.1	14	48.7	+60.0	134.3	14	06.7	+60.0	134.5	13	24.6	+60.0	134.7	12	42.4	+60.0	135.0	12
13	17	53.6	+59.7	133.6	17	12.1	+59.8	133.8	16	30.5	+59.8	134.1	15	48.7	+59.9	134.3	15	06.7	+60.0	134.5	14	24.6	+60.0	134.7	13	42.4	+60.0	135.0	13
14	18	53.3	+59.8	133.5	18	11.9	+59.8	133.8	17	30.3	+59.9	134.0	16	48.6	+59.9	134.2	16	06.7	+59.9	134.4	15	24.6	+60.0	134.6	14	42.4	+60.0	135.0	14
15	19	53.1	+59.7	133.4	19	11.7	+59.9	133.7	18	30.2	+59.9	133.9	17	48.5	+59.9	134.2	17	06.6	+60.0	134.4	16	24.6	+59.9	134.6	15	42.4	+60.0	134.8	15
16	20	52.8	+59.8	133.3	20	11.6	+59.8	133.6	19	30.1	+59.9	133.9	18	48.4	+59.9	134.1	18	06.6	+59.9	134.3	17	24.5	+60.0	134.6	16	42.4	+60.0	135.0	16
17	21	52.6	+59.7	133.2	21	11.4	+59.8	133.5	20	30.0	+59.8	133.8	19	48.3	+60.0	134.1	19	06.5	+60.0	134.3	18	24.5	+60.0	134.5	17	42.3	+60.0	134.8	17
18	22	52.3	+59.7	133.1	22	11.2	+59.8	133.4	21	29.8	+59.9	133.7	20	48.3	+59.9	134.0	20	06.5	+59.9	134.3	19	24.5	+60.0	134.5	18	42.3	+60.0	134.8	18
19	23	52.0	+59.8	133.0	23	11.0	+59.8	133.3	22	29.7	+59.9	133.6	21	48.2	+59.9	133.9	21	06.4	+60.0	134.2	20	24.5	+60.0	134.5	19	42.3	+60.0	135.0	19
20	24	51.8	+59.7	132.9	24	10.8	+59.8	133.3	23	29.6	+59.8	133.6	22	48.1	+59.9	133.9	22	06.4	+59.9	134.2	21	24.5	+59.9	134.5	20	42.3	+60.0	134.7	20
21	25	51.5	+59.7	132.8	25	10.6	+59.8	133.2	24	29.4	+59.9	133.5	23	48.0	+59.9	133.8	23	06.3	+60.0	134.1	22	24.4	+60.0	134.4	21	42.3	+60.0	134.7	21
22	26	51.2	+59.7	132.7	26	10.4	+59.8	133.1	25	29.3	+59.8	133.4	24	47.9	+59.9	133.8	24	06.3	+59.9	134.1	23	24.4	+60.0	134.4	22	42.3	+60.0	134.7	22
23	27	50.9	+59.8	132.6	27	10.2	+59.8	133.0	26	29.1	+59.9	133.3	25	47.8	+59.9	133.7	25	06.2	+60.0	134.0	24	24.4	+60.0	134.4	23	42.3	+60.0	134.7	23
24	28	50.7	+59.7	132.5	28	10.0	+59.8	132.9	27	29.0	+59.8	133.3	26	47.7	+59.9	133.6	26	06.2	+59.9	134.0	25	24.4	+60.0	134.3	24	42.3	+60.0	134.7	24
25	29	50.4	+59.7	132.4	29	09.8	+59.7	132.8	28	28.8	+59.8	133.2	27	47.6	+59.9	133.6	27	06.1	+60.0	134.0	26	24.4	+59.9	134.3	25	42.3	+60.0	134.7	25
26	30	50.1	+59.7	132.3	30	09.5	+59.8	132.7	29	28.7	+59.8	133.1	28	47.5	+59.9	133.5	28	06.1	+59.9	133.9	27	24.3	+60.0	134.3	26	42.3	+60.0	134.7	26
27	31	49.8	+59.6	132.1	31	09.3	+59.8	132.6	30	28.5	+59.9	133.0	29	47.4	+59.9	133.4	29	06.0	+60.0	133.9	28	24.3	+60.0	134.6	27	42.0	+60.0	134.7	27
28	32	49.4	+59.7	132.0	32	09.1	+59.8	132.5	31	28.4	+59.8	132.9	30	47.3	+59.9	133.4	30	06.0	+59.9	133.8	29	24.3	+60.0	134.6	28	42.0	+60.0	134.7	28
29	33	49.1	+59.7	131.9	33	08.9	+59.7	132.4	32	28.2	+59.9	132.9	31	47.2	+59.9	133.3	31	05.9	+60.0	133.8	30	24.3	+59.9	134.2	29	42.3	+60.0	134.6	29
30	34	48.8	+59.7	131.8	34	08.6	+59.8	132.3	33	28.1	+59.8	132.8	32	47.1	+59.9	133.2	32	05.9	+59.9	133.7	31	24.2	+60.0	134.2	30	42.3	+60.0	134.6	30
31	35	48.5	+59.6	131.6	35	08.4	+59.7	132.2	34	27.9	+59.8	132.7	33	47.0	+59.9	133.2	33	05.8	+59.9	133.7	32	24.2	+60.0	134.1	31	42.3	+60.0	134.6	31
32	36	48.1	+59.7	131.5	36	08.1	+59.8	132.1	35	27.7	+59.9	132.6	34	46.9	+59.9	133.1	34	05.7	+60.0	133.6	33	24.2	+60.0	134.6	32	42.3	+60.0	135.0	32
33	37	47.8	+59.6	131.4	37	07.9	+59.7	131.9	36	27.6	+59.8	132.5	35	46.8	+59.9	133.0	35	05.7	+59.9	133.5	34	24.2	+59.9	134.5	33	42.3	+60.0	135.0	33
34	38	47.4	+59.6	131.3	38	07.6	+59.7	131.8	37	27.4	+59.8	132.4	36	46.7	+59.9	132.0	36	05.6	+60.0	134.0	35	24.1	+60.0	134.3	34	42.2	+60.0	135.0	34
35	39	47.0	+59.6	131.1	39	07.3	+59.8	131.7	38	27.2	+59.8	132.3	37	46.6	+59.9	132.9	37	05.6	+59.9	133.4	36	24.1	+60.0	134.5	35	42.2	+60.0	135.0	35
36	40	46.6	+59.6	130.9	40	07.1	+59.7	131.6	39	27.0	+59.8	132.2	38	46.5	+59.9	132.8	38	05.5	+59.9	133.4	37	24.1	+60.0	134.5	36	42.2	+60.0	135.0	36
37	41	46.2	+59.6																										

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 45°, 315°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	4 56.6 -59.8	134.8	4 14.3 -59.8	134.8	3 32.0 -59.9	134.9	2 49.6 -59.9	134.9	2 07.3 -60.0	135.0	1 24.8 -59.9	135.0	0 42.4 -60.0	135.0	0 00.0 +60.0	45.0	0 00.0 +60.0	45.0	0 00.0 +60.0	45.0	0 00.0 +60.0	45.0	0 00.0 +60.0	45.0	0
1	3 56.8 -59.7	134.9	3 14.5 -59.8	134.9	2 32.1 -59.9	135.0	1 49.7 -59.9	135.0	1 07.3 -60.0	135.0	0 24.9 -60.0	135.0	0 17.6 +60.0	45.0	1 00.0 +60.0	45.0	1 00.0 +60.0	45.0	1 00.0 +60.0	45.0	1 00.0 +60.0	45.0	1 00.0 +60.0	45.0	1
2	2 57.1 -59.8	135.0	2 14.7 -59.9	135.0	1 32.2 -59.9	135.0	0 49.8 -59.9	135.0	0 07.3 -59.9	135.0	0 35.1 +60.0	45.0	1 17.6 +60.0	45.0	2 00.0 +60.0	45.0	2 00.0 +60.0	45.0	2 00.0 +60.0	45.0	2 00.0 +60.0	45.0	2 00.0 +60.0	45.0	2
3	1 57.3 -59.8	135.0	1 14.8 -59.8	135.1	0 32.3 -59.8	135.1	0 10.1 +60.0	44.9	0 52.6 +60.0	44.9	1 35.1 +60.0	44.9	2 17.6 +60.0	45.0	3 00.0 +60.0	45.0	3 00.0 +60.0	45.0	3 00.0 +60.0	45.0	3 00.0 +60.0	45.0	3 00.0 +60.0	45.0	3
4	0 57.5 -59.8	135.1	0 15.0 -59.9	135.1	0 27.5 +59.9	44.9	1 10.1 +59.9	44.9	1 52.6 +59.9	44.9	2 35.1 +60.0	44.9	3 17.6 +60.0	44.9	4 00.0 +60.0	45.0	4 00.0 +60.0	45.0	4 00.0 +60.0	45.0	4 00.0 +60.0	45.0	4 00.0 +60.0	45.0	4
5	0 02.3 +59.7	44.8	0 44.9 +59.8	44.8	1 27.4 +59.9	44.8	2 10.0 +59.9	44.8	2 52.5 +60.0	44.9	3 35.1 +59.9	44.9	4 17.6 +59.9	44.9	5 00.0 +60.0	45.0	5 00.0 +60.0	45.0	5 00.0 +60.0	45.0	5 00.0 +60.0	45.0	5 00.0 +60.0	45.0	5
6	1 02.0 +59.8	44.7	1 44.7 +59.8	44.7	2 27.3 +59.9	44.7	3 09.9 +60.0	44.8	3 52.5 +60.0	44.8	4 35.0 +60.0	44.9	5 17.5 +60.0	44.9	6 00.0 +60.0	45.0	6 00.0 +60.0	45.0	6 00.0 +60.0	45.0	6 00.0 +60.0	45.0	6 00.0 +60.0	45.0	6
7	2 01.8 +59.8	44.6	2 44.5 +59.9	44.6	3 27.2 +59.9	44.7	4 09.9 +59.9	44.7	4 52.5 +59.9	44.8	5 35.0 +60.0	44.8	6 17.5 +60.0	44.9	7 00.0 +60.0	45.0	7 00.0 +60.0	45.0	7 00.0 +60.0	45.0	7 00.0 +60.0	45.0	7 00.0 +60.0	45.0	7
8	3 01.6 +59.8	44.5	3 44.4 +59.8	44.6	4 27.1 +59.9	44.6	5 09.8 +59.9	44.7	5 52.4 +60.0	44.7	6 35.0 +60.0	44.8	7 17.5 +60.0	44.9	8 00.0 +60.0	45.0	8 00.0 +60.0	45.0	8 00.0 +60.0	45.0	8 00.0 +60.0	45.0	8 00.0 +60.0	45.0	8
9	4 01.4 +59.7	44.4	4 44.2 +59.8	44.5	5 27.0 +59.9	44.6	6 09.7 +59.9	44.6	6 52.4 +59.9	44.7	7 35.0 +60.0	44.8	8 17.5 +60.0	44.9	9 00.0 +60.0	45.0	9 00.0 +60.0	45.0	9 00.0 +60.0	45.0	9 00.0 +60.0	45.0	9 00.0 +60.0	45.0	9
10	5 01.1 +59.8	44.4	5 44.0 +59.9	44.4	6 26.9 +59.8	44.5	7 09.6 +60.0	44.6	7 52.3 +60.0	44.7	8 35.0 +60.0	44.8	9 17.5 +60.0	44.9	10 00.0 +60.0	45.0	10 00.0 +60.0	45.0	10 00.0 +60.0	45.0	10 00.0 +60.0	45.0	10 00.0 +60.0	45.0	10
11	6 00.9 +59.8	44.3	6 43.9 +59.8	44.3	7 26.7 +59.9	44.4	8 09.6 +59.9	44.5	8 52.3 +60.0	44.6	9 35.0 +59.9	44.7	10 17.5 +60.0	44.9	11 00.0 +60.0	45.0	11 00.0 +60.0	45.0	11 00.0 +60.0	45.0	11 00.0 +60.0	45.0	11 00.0 +60.0	45.0	11
12	7 00.7 +59.8	44.2	7 43.7 +59.8	44.3	8 26.6 +59.9	44.4	9 09.5 +59.9	44.5	9 52.3 +59.9	44.6	10 34.9 +60.0	44.7	11 17.5 +60.0	44.9	12 00.0 +60.0	45.0	12 00.0 +60.0	45.0	12 00.0 +60.0	45.0	12 00.0 +60.0	45.0	12 00.0 +60.0	45.0	12
13	8 00.5 +59.7	44.1	8 43.5 +59.9	44.2	9 26.5 +59.9	44.3	10 09.4 +59.9	44.4	10 52.2 +60.0	44.6	11 34.9 +60.0	44.7	12 17.5 +60.0	44.8	13 00.0 +60.0	45.0	13 00.0 +60.0	45.0	13 00.0 +60.0	45.0	13 00.0 +60.0	45.0	13 00.0 +60.0	45.0	13
14	9 00.2 +59.8	44.0	9 43.4 +59.8	44.1	10 26.4 +59.9	44.2	11 09.3 +60.0	44.4	11 52.2 +59.9	44.5	12 34.9 +60.0	44.7	13 17.5 +60.0	44.8	14 00.0 +60.0	45.0	14 00.0 +60.0	45.0	14 00.0 +60.0	45.0	14 00.0 +60.0	45.0	14 00.0 +60.0	45.0	14
15	10 00.0 +59.8	43.9	10 43.2 +59.8	44.0	11 26.3 +59.9	44.2	12 09.3 +59.9	44.3	12 52.1 +60.0	44.5	13 34.9 +60.0	44.6	14 17.5 +60.0	44.8	15 00.0 +60.0	45.0	15 00.0 +60.0	45.0	15 00.0 +60.0	45.0	15 00.0 +60.0	45.0	15 00.0 +60.0	45.0	15
16	10 59.8 +59.7	43.8	11 43.0 +59.8	44.0	12 26.2 +59.8	44.1	13 09.2 +59.9	44.3	13 52.1 +59.9	44.4	14 34.9 +59.9	44.6	15 17.5 +60.0	44.8	16 00.0 +60.0	45.0	16 00.0 +60.0	45.0	16 00.0 +60.0	45.0	16 00.0 +60.0	45.0	16 00.0 +60.0	45.0	16
17	11 59.5 +59.8	43.7	12 42.8 +59.9	43.9	13 26.0 +59.9	44.0	14 09.1 +59.9	44.2	14 52.0 +60.0	44.4	15 34.8 +60.0	44.6	16 17.5 +60.0	44.8	17 00.0 +60.0	45.0	17 00.0 +60.0	45.0	17 00.0 +60.0	45.0	17 00.0 +60.0	45.0	17 00.0 +60.0	45.0	17
18	12 59.3 +59.8	43.6	13 42.7 +59.8	43.8	14 25.9 +59.9	44.0	15 09.0 +59.9	44.2	15 52.0 +59.9	44.4	16 34.8 +60.0	44.6	17 17.5 +60.0	44.8	18 00.0 +60.0	45.0	18 00.0 +60.0	45.0	18 00.0 +60.0	45.0	18 00.0 +60.0	45.0	18 00.0 +60.0	45.0	18
19	13 59.1 +59.7	43.6	14 42.5 +59.8	43.7	15 25.8 +59.9	43.9	16 08.9 +60.0	44.1	16 51.9 +60.0	44.3	17 34.8 +60.0	44.5	18 17.5 +60.0	44.8	19 00.0 +60.0	45.0	19 00.0 +60.0	45.0	19 00.0 +60.0	45.0	19 00.0 +60.0	45.0	19 00.0 +60.0	45.0	19
20	14 58.8 +59.8	43.5	15 42.3 +59.8	43.6	16 25.7 +59.8	43.8	17 08.9 +59.9	44.1	17 51.9 +60.0	44.3	18 34.8 +60.0	44.5	19 17.5 +60.0	44.7	20 00.0 +60.0	45.0	20 00.0 +60.0	45.0	20 00.0 +60.0	45.0	20 00.0 +60.0	45.0	20 00.0 +60.0	45.0	20
21	15 58.6 +59.8	43.4	16 42.1 +59.9	43.6	17 25.5 +59.9	43.8	18 08.8 +59.9	44.0	18 51.9 +59.9	44.2	19 34.8 +59.9	44.5	20 17.5 +60.0	44.7	21 00.0 +60.0	45.0	21 00.0 +60.0	45.0	21 00.0 +60.0	45.0	21 00.0 +60.0	45.0	21 00.0 +60.0	45.0	21
22	16 58.4 +59.7	43.3	17 42.0 +59.8	43.5	18 25.4 +59.9	43.7	19 08.7 +59.9	43.9	19 51.8 +60.0	44.2	20 34.7 +60.0	44.5	21 17.5 +60.0	44.7	22 00.0 +60.0	45.0	22 00.0 +60.0	45.0	22 00.0 +60.0	45.0	22 00.0 +60.0	45.0	22 00.0 +60.0	45.0	22
23	17 58.1 +59.8	43.2	18 41.8 +59.8	43.4	19 25.3 +59.9	43.6	20 08.6 +59.9	43.9	20 51.8 +59.9	44.2	21 34.7 +60.0	44.4	22 17.5 +60.0	44.7	23 00.0 +60.0	45.0	23 00.0 +60.0	45.0	23 00.0 +60.0	45.0	23 00.0 +60.0	45.0	23 00.0 +60.0	45.0	23
24	18 57.9 +59.7	43.1	19 41.6 +59.8	43.3	20 25.2 +59.8	43.6	21 08.5 +60.0	43.8	21 51.7 +60.0	44.1	22 34.7 +60.0	44.4	23 17.5 +60.0	44.7	24 00.0 +60.0	45.0	24 00.0 +60.0	45.0	24 00.0 +60.0	45.0	24 00.0 +60.0	45.0	24 00.0 +60.0	45.0	24
25	19 57.6 +59.8	43.0	20 41.4 +59.8	43.2	21 25.0 +59.9	43.5	22 08.5 +59.9	43.8	22 51.7 +59.9	44.1	23 34.7 +60.0	44.4	24 17.5 +59.9	44.7	25 00.0 +60.0	45.0	25 00.0 +60.0	45.0	25 00.0 +60.0	45.0	25 00.0 +60.0	45.0	25 00.0 +60.0	45.0	25
26	20 57.4 +59.7	42.9	21 41.2 +59.8	43.2	22 24.9 +59.9	43.4	23 08.4 +59.9	43.7	23 51.6 +60.0	44.0	24 34.7 +59.9	44.3	25 17.4 +60.0	44.6	26 00.0 +60.0	45.0	26 00.0 +60.0	45.0	26 00.0 +60.0	45.0	26 00.0 +60.0	45.0	26 00.0 +60.0	45.0	26
27	21 57.1 +59.7	42.8	22 41.0 +59.8	43.1	23 24.8 +59.8	43.4	24 08.3 +59.9	43.7	24 51.6 +59.9	44.0	25 34.6 +60.0	44.3	26 17.4 +60.0	44.6	27 00.0 +60.0	45.0	27 00.0 +60.0	45.0	27 00.0 +60.0	45.0	27 00.0 +60.0	45.0	27 00.0 +60.0	45.0	27
28	22 56.8 +59.8	42.7	23 40.8 +59.8	43.0	24 24.6 +59.8	43.3	25 08.2 +59.9	43.6	25 51.5 +60.0	43.9	26 34.6 +60.0	44.2	27 17.4 +60.0	44.6	28 00.0 +60.0	45.0	28 00.0 +60.0	45.0	28 00.0 +60.0	45.0	28 00.0 +60.0	45.0	28 00.0 +60.0	45.0	28
29	23 55.2 +59.7	42.6	24 39.6 +59.8	42.4	25 23.8 +59.8	42.8	26 07.6 +59.9	43.2	26 51.2 +59.9	43.6	32 34.5 +59.9	44.1	33 17.4 +60.0	44.4	34 00.0 +60.0	45.0	34 00.0 +60.0	45.0	34 00.0 +60.0	45.0	34 00.0 +60.0	45.0	34 00.0 +6		